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THE INVISIBLE WORLD.

I HAVE been honoured by the request that, as President of this Institute, I would deliver the first lecture of the series of this season. Anticipating as I do that it will be followed by a very useful succession of meetings like the present, I cannot enter upon my duty without first expressing my earnest hope that, under God's blessing, this Institution may be of great public and private benefit to this town and neighbourhood. The opportunities of public meetings for discussion, for instruction, and for amusement, that a building like this affords, are an advantage which can only be appreciated by being first enjoyed and proved. There are a thousand little defects and infirmities of our common nature which an enlarged intercourse with each other on such occasions has an irresistible tendency to eradicate and overcome. It is a great privilege, after the business of the day is over, which occupies most of us beyond what we feel to be healthful for mind or body, to be able to repair the ‘waste of tissue,’ and to return, as it were, to our independent souls and selves for a few agreeable and useful hours; making that use of the evening which both pagan and christian literature agree in marking as the purpose and destination of such hours—the first by the very language of ancient Greece in which the poetic word for night (εὐφρόνη) is synonymous with good and pleasant thoughts—the latter by the well-known words of the Psalmist, that ‘Night unto night giveth knowledge.’

The particular subject which I have selected for this the opening lecture of the season, is one which I can easily suppose will have occasioned some surprise and curiosity—The Invisible World! What can he mean by the Invisible World? Something very mysterious, no doubt!—something very far removed from the practical ordinary life of men and things—something more curious than useful—Mesmerism perhaps, or Electro-biology—Table-turning, Spirit-rapping, or some other form of ideology and spirit life. These seem to be the topics suggested by the ordinary ideas of what belongs to the Invisible World.

Well; if I had cared much about a name, I might have avoided this and chosen another title. But, in truth, this is the one that does most exactly express the lesson I want, as a whole, to convey. If the title is liable to popular misconstruction, I hope to be able to show you that the fault is in the popular mind; and I will take the whole responsibility of a misconstruable name, if you will, by your favourable attention for one short hour, allow me the privilege of endeavouring to correct it, and to awaken your own inquiries upon the line of thought taken upon some of the great topics that daily occupy the attention of us all.

If I had followed in the well-known beaten track, I should no doubt have addressed you on 'The Objects, Advantages, and Pleasures of Science.' This would have been the regular old coach, licensed to carry *one* inside and any number of outside passengers, upon the old road. But I have no idea of reading you a lecture upon what you could get from books—books which now-o'-days even children are expected to read. A lecture should, I conceive, be upon something more intimately arising from our own deductive thoughts than books themselves can ever give. Books, we are often told, do not and can-

OCCASIONAL ESSAYS.

the storm was now over and they might come above. But no one came; and in reply to a second summons, no one answered. So after some waiting, the captain went himself down to them. Who could describe the scene that met his sight? In one short and terrible phrase, 'Behold, they were all *dead corpses*!' And even that was not the worst; for there were fearful evidences that in the maddening agonies of the death-struggle they had bruised and torn each other, so that the scene was one not of the quiet work of death-alone, but of blood and carnage,—the description of it, one of the most revolting and heartrending I ever read.

The captain was a 'practical man' in his profession. He knew or was reputed to know his business as well as any one of his standing in the service. He had traversed sea and ocean, and knew them by chart and compass, and he bore the character of a humane man.

But there was one vast and deep ocean, some forty miles deeper than the plummet ever sounded, and which he had been sailing in, and by, all his sailing life, but about which, unluckily, he knew nothing—that life-sustaining ocean which envelopes our whole globe of land and sea—that invisible compound of two invisible gases, Oxygen and Nitrogen, in which physically we 'live and move and have our being;' that translucent and sightless element which is now filling this room; from which were it to be withdrawn for only the space of *one minute*, a scene would instantly begin, perhaps not dissimilar to that which no mortal eye remained to tell the beginning or the end of, in the steerage cabin of the hapless barque *Queen Adelaide.*

We are ready to exclaim at the ignorance of a man who forgot, or never knew, that the vital air of heaven was necessary, fresh and fresh every moment, to human lungs, and that the want of it, even for a few minutes, was *death*! Yet it may make our indignation pause if we were to ask ourselves how many of us would have voted it requisite or desirable that a boy going to sea in the merchant service should have first undergone instruction and examination in those branches of study called Chemistry and Physiology; the first teaching him the constitution of the atmosphere, the second its relation to and absorption by the lungs of men and other animals. And perhaps, also, I might be so bold as to ask how many of us here assembled, if called upon to convey the reprimand to the wretched captain whose ignorance had consigned to torturing death 150 of his fellow-creatures, would be able to explain to him *why they died*, by describing the invisible process performed by the invisible atmosphere in the air-cells of the human lungs, whose vital action must also be for ever invisible to the eye, the exposure of it being equivalent to death?

I spoke just now of the air we breathe (the invisible sustainer of every moment of our life) as consisting of two gases—Oxygen and Nitrogen. But there is another kind of life besides ours on the face of the earth; I mean the life of plants and other vegetables; and here we get into a still more mysterious chamber of the Invisible World.

When people look at the bulky stem of an oak or elm tree, they commonly speak of it as one of the productions of the earth. They could hardly for a moment be led to suppose that the phrase they use is, in the sense in which they mean it, incorrect. They can see the tree, and they see the ground it grows on; both are solid, and tangible, and visible to the eye, and they can see nothing but the most obvious conclusion that the ground produced the plant. It bears it, at any rate; so it does our beautiful spire of Ross Church; but inasmuch as that is built of stone, the earth may with more physiological accuracy be called the producer of the spire than of any tree that ever grew. For, in that invisible ocean of air which bends the branches of the tree, and stirs the weathercock of the spire, there wanders about a little insignificant-seeming quantity of a certain other gas which I have not yet named, so scantily distributed as to form only one part in 2,500 of the atmosphere, and though perfectly invisible, yet so heavy compared with the rest, that it may be poured from one glass into another, like water. Its name is Carbonic Acid, and if I omitted to name it to you before, you will believe it is not for its want of importance, when I tell you that to this invisible tenant of the air, and not to the solid ground, is due the growth and bulk of the timber tree, and of all the forests upon the face of the earth, and of all the coal-beds under it.

To those who may not be already familiar with the process, I fear I shall hardly have time to describe here, in sufficient detail to make it fully intelligible, the system of the Nutrition of Plants from the Atmosphere. This you can get from books, and we must hurry on to other realms of the Invisible World. Mrs. Marcet, Dr. Carpenter, Professor Lindley, the

Baron Dutrochet, and the experiments of the great De Candolle will best furnish this beautiful chapter of natural history; how the little leaf, stimulated by the action of the sun upon its surfaces, sucks in carbonic acid from the air, decomposes it, rejecting the oxygen (for which we who want it are much obliged), and retaining the carbon (for which again we are obliged, it being poison to our lungs, and constantly thrown off by them); and how the water pumped up from the ground through the vascular tissue of the stem and branches undergoes similar decomposition in the clever laboratory of the leaf—yields up its oxygen to the air, and its hydrogen to the carbon, which now begins to organise as real 'sap,' and commences its downward journey through every portion of the tree laden with *liquid wood,* and forming the new tissue of this year's growth underneath the bark; just as a bee gives its honey to the hive, forming the cell and its rich contents, as dear old Dr. Watts used to tell us.

You will see, from this very brief explanation, enough to make it understood that the growth (that is, the new deposition of wood) of a tree is not upwards from the ground but *downwards from the leaves,* the water drawn up from the earth being chiefly for its use *as water*,—in fact, a moistener and vehicle for the conveyance and distribution of the food to every portion of the plant, much in the same manner as our food is moistened in the mouth by saliva to smooth its passage down the throat. I have said, however, that it yields hydrogen to the plant, and also contains in solution certain earthy salts—sulphur, lime, phosphorus, soda, potash, and iron—bearing altogether not a very much greater relation to the *bulk* of a tree than the condiments, salt, pepper, mustard and others, do to our food, and the nourishment of our bodies. But geologists tell us that we live, atmospherically speaking, in degenerate days; that there was a time in the history of our planet when this timber-making gas—this carbonic acid—was much more abundant than it is now in the atmosphere, and that, in consequence, vegetable growth of all kinds, trees of course included, was so rapid and monstrous that (to take a single specimen) the little plant which we know as the fern grew to the magnitude of our fir trees. In those periods it was that the great coal-beds, of which we now avail ourselves so largely, were deposited. For those coal-beds are only buried forests, pressed by the superincumbent weight of earth into a laminated or cake-like form.

Now, whether it be in the form of wood or of coal, the same thing takes place on combustion. The main bulk returns into the atmosphere from whence it came, and assumes there the same invisible condition, as carbonic acid gas, which it had before it was manufactured by the chemistry of the leaf into the visible and tangible shape of wood. Most of us have noticed, in the case of a bonfire, what heaps of fuel are used, what substantial pieces of wood, branches of trees, &c., are piled on, and how, as the devouring flame proceeds, they appear to pass away into nothing, leaving only a few grey ashes on the ground, the honest restoration of all they ever took from it, exactly so much and no more. But is it not curious to reflect that that which becomes a tree was, as far as our power of vision is concerned, originally 'nothing,' and that when the whole body of it undergoes combustion, it returns again to the same apparent nothing out of which it came? But surely it is still more curious that in this substantial though only temporary condition it should lie buried perhaps for millions of years in the bowels of the earth, waiting as it were for its release at the hands of man, and its restoration by fire to its original and normal condition —a free gas floating in the realms of space, invisible indeed to our eyes, but as real and self-existent, and, I may say, as strictly *substantial* in its properties and capabilities, as it was when rendered visible by organisation in the form of an oak tree or a block of coal.

But it will be in your remembrance that we do not always allow the invisible result of coal combustion to escape quite so easily into its native free condition. What is all that apparatus which we see in the suburbs of every town with miles of pipe branching from it under every street, and almost turning night into day, with the brilliancy of a light which *burns without a wick?* What better or more luminous sample could we have of the Invisible World than the apparent nothing which courses along those pipes, about to burst into flame at the end of its journey, and escape from an imprisonment whose duration might count centuries as days? Who would now suppose that the idea of lighting up a town with the gas from coal conveyed by pipes underground, caused a smile of distrust on the face of the great Sir Humphry Davy, the father of modern chemistry?

I have pointed out to you that the largest masses of wood when burnt are reduced to a small ash—upwards of 95 parts of every 100 disappear—return to the Invisible World from whence they came, and where they reside, in what I must call their *natural condition*. But if this be so with the vegetable world, what happens in the case of the animal part of creation—in our *own* case for instance? Are we, too, mere temporary occupants, mere tenants on sufferance of our solid and visible substantial forms? Is *our* native home also in the Invisible World? I remember once when I was on a visit to Mr. Lawes, the well-known practical experimentalist in agricultural chemistry, that a deputation from the French Minister of Agriculture arrived at Rothamsted (his residence) to inspect his celebrated laboratory and museum. In passing through it, and listening to such explanations as there was time to give of the different objects, it seemed that nothing so riveted their attention and astonishment as the contents of a large glass jar, about a foot high, and half that in diameter, which stood upon one of the shelves against the wall. The label upon it showed that the jar contained the solid remains of an ox! You would hardly have blamed the astonishment and laughter of the Frenchmen on being again and again assured that a whole ox—flesh and bones, horns, hoofs, and tail, incinerated and evaporated, reduced to the mere inorganic residuum that the earth could call its own—all in fact that had escaped volatilisation into its native air—was able to be quietly packed in a two-quart jar (or whatever the measure was). As Macbeth said of the witch trio—

> 'Whither had it vanished!
> Into the air, and what seemed corporeal, had melted
> Like breath into the wind!'

And if such be the compression which a full-sized stalled ox could be brought to submit to, what, if I may ask so personal a question, would be likely to happen, do you think, *to you or me* under similar unpleasant circumstances? Can it be indeed true—I am almost afraid it is—that the very greatest member of this august assembly, after delivering up what this provoking Invisible World of mine would claim as its own, would go conveniently enough as the inside passenger of a quart pot? Ladies, I am sorry to be such a stingy sexton or undertaker, but I fear I cannot conscientiously offer to you even so much, not more than a pint tumbler! As for you, youngsters, a soda-water bottle would do for you. A little phosphorus and lime for your bones, a dash of sulphur for your beautiful ornament of hair, a few grains of silex (flint) for your nails and the enamel of your teeth, with a little potash, iron, and soda,—and there you are!—or rather (as the Brighton coachman said)—'Where *are* 'you?'

Can this indeed be all? Yes, this indeed is all, and all besides this must return into that vast alembic, that storehouse without bars or bolts, that invisible warehouse, where the materials of fresh ladies and gentlemen are only waiting till their turn comes round again, to be absorbed by fresh lungs and fresh digestive apparatus into the solid-seeming but ephemeral forms of animal life.

And now let us pass on to an, if possible, still more, important member of the Invisible World. All of us are familiar with the power of Steam—'offspring 'of the union of fire and water;' nay, so familiar are we, that I would almost venture to say that many ot my young hearers think they have had personal and visual acquaintance with it, issuing, for instance, from the escape-valve of a steam engine, or, by'r Lady! from the spout of a tea-kettle. But no! here again I must call them back to my Invisible World. What they see is not Steam, but Vapour, *i.e.* an invisible thing rendered visible by condensation from contact with cold air. But if you could take a peep inside, and see the mighty giant 'at home,' in the boiler, or under the piston in the cylinder, what would you see? Nothing! The great moving power of the modern world—the thing that drives a vessel of 3,000 tons against wind and tide across the Atlantic, or hammers a 20-ton plate of iron into shape as easily as you would mould a pellet of bread between your fingers—no human eye ever beheld, even when by its wonderful expansive property it is exerting 500 or 1,000 horse power!

Reflect for a moment upon this combination. Here is coal, a solid body, releasing itself into its native condition of an invisible gas, and, in so doing, converting water into an invisible element—Steam—which is lifting a piston-rod by a gigantic power which you *cannot see* in action, but can only judge of by its *results*.

But powerful as steam may be, we must not attribute to it more than its due; we must not confuse steam with power. Steam is only a condition kept alive by heat, the result of the combustion of fuel. Fuel may with propriety of expression be called the equivalent of power. But it is worth reflection that all this power proceeds originally from the Sun, which is as truly the great centre of power upon the earth as it is of light or heat; and thus coal is *accumulated sun force*, for it is only by the operation of the solar light that plants are enabled to decompose the carbonic acid of the atmosphere, in the manner I have before described: in the absence of the sun the operation ceases. Without it, all power upon the earth would cease.

But this very sunlight which exercises so important an influence on the growth of plants, affords another remarkable specimen of the Invisible World. You have all heard of the great Sir Isaac Newton, and of his wonderful discovery that the Light of the sun, though it has, properly speaking, no colour of its own, is a combination of all colours. He made this discovery by means of a piece of glass, cut into a three-sided form, which is called a Prism, and has the property of dissecting the rays of the sun and of displaying separately all the colours they contain, namely, the primary colours—blue, yellow, and red, with their compounds or secondaries, green, orange, and violet lying respectively between the parent colours, and always preserving the same relative position. Now, each of these rays has perfectly distinct properties of its own, and different degrees of heat, and, what is perhaps more curious, different angles of refraction; and this is why the prism has the power to separate them and exhibit them apart:

just as if a bullet from a rifle striking on a target placed diagonally towards the muzzle of the rifle were to burst into seven pieces, each flying off at a different angle. The purple or violet ray deviates the widest, then comes the blue, and the green and the others follow in regular succession, as you see them in the rainbow, which is in fact a natural prism, water (rain) having the same refractive property as glass. Now what I have mentioned the prism for is this: there lies amongst these visible and coloured rays, one space which appears to be empty. For a long time it was supposed to be a sort of vacancy or band separating the prismatic colours into two divisions; but on further investigation it is found that this seemingly empty place is in fact occupied by a ray *without colour*, and consequently invisible to our eyes. Far from being a mere negative and empty space, it is in some respects the most powerful of all the rays. The thermometer can detect it, the hand can feel it, but the eye cannot see it. Even the developing power of the prism fails to reveal it. It belongs to the Invisible World.

Before I leave this subject of colour, I may, in connection with those gases which I spoke of, mention that, though invisible themselves, they each of them seem to give token of their presence by certain favourite hues, which by no great stretch of metaphor may be called their *liveries.* We know how pale and delicate a tint of green it is that first appears upon the trees in early spring. Why does the leaf acquire a darker and deeper green as summer advances? And why does the autumn with its decay incarnadine the plant,

'Making the green one red?'

The cause is very simple. The natural colour of the fibrous tissue of plants is a pale straw yellow. This you see in all plants that have been earthed up by the gardener, or grown in a dark place where the sunshine could not reach them. On exposure to the action of the sun's rays they immediately absorb carbonic acid from the air, and invisible as this gas is, *blue-black* is its livery colour, and it makes its presence and action known by uniting with the straw-coloured tissue of the plant into *green*—at first light and yellowish, but of a deeper tinge as, summer proceeding, the days lengthen and increase in duration and intensity of light, to which the absorptive power is due; but when the days begin to shorten, and light to diminish, and the cold nights chill and contract the foot-stalk of the leaf, so that it can no longer pass the descending sap from the leaf into the tree, the absorption of carbonic acid can go on no longer; and oxygen, the parent of decomposition, ever ready to pounce upon its prey, becomes absorbed instead, and though itself invisible, instantly *hoists its colours*, red and brownish yellow, staining and blotching the green leaf with its rich but melancholy hues. But if its red uniform comes like an enemy here, we owe to the same artist the crimson hue of the life-stream that flows in healthy veins; and even the ruby lips and rosy cheeks that I must not allude to, as present company, are indebted (I trust!) to no other cosmetic than the invisible gas, oxygen.

But we must pass on; for a still more important element of that mysterious world yet awaits our notice. We have already mentioned Steam, which takes us over sea and land with such rapidity as the vessel or the train moves along. But, rapidly as the train may take us, there is another traveller at our side whose amazing flight, compared with our utmost express speed, could hardly be described in the language of comparison. I speak of that Electric current, invisible to mortal eye, which is passing along the telegraph wires at our side. But here again I shall have to undeceive some of my hearers, who may be under the impression that they have seen what they would call electricity, in the shape, for instance, of an electric spark, or Lightning. When the irresistible electric current meets with any obstruction, or non-conducting medium, it shatters it, if solid, or produces momentary combustion of the atmosphere as in passing from one cloud to another, or from a cloud to the earth. But that is an effect produced upon other bodies; just as a cannon-ball flying too rapidly to be seen, may yet knock up the stones from a road, or smash a tree that lies in its path. What we see is the dust that he makes, not the traveller himself. And he is a rapid traveller indeed! The speed with which light flies from the sun to the earth is 192,000 miles in a second. What the speed of the electric current is, is not, I believe, exactly known; but it is known to be greater than *that*! A telegraphic message, conveyed absolutely free from all mechanical obstruction, would go ten times round the globe we inhabit in less than two seconds—faster, in fact, than the words could be pronounced by a rapid speaker. But, as I have said, no mortal eye has ever beheld that traveller; should any turnpike gate dispute his passage, he leaves his mark indeed behind him; but before our eyes behold it, faster than even thought can follow, he is millions of miles away, in that invisible world to which he belongs, and of which he is one of the most distinguished inhabitants.

After speaking of Electricity, I need hardly, perhaps, mention the Magnet, which is another form of the same power; but what more striking instance of the Invisible could be mentioned than that of the unseen hand which draws iron to it at one end and repels it at the other—a sort of push-and-pull machine without machinery!—except such as belongs to the Invisible World?

It would perhaps be opening too remote a branch of my subject, though properly within its limits, were I to dilate upon that immense branch of the world invisible to the unaided human eye which the Microscope reveals. It would lead us into too wide a field even to touch upon that chapter of creation which lay behind the scenes of human speculation utterly unknown and unsuspected till the lens of the Microscope appeared. This showed us that the portion of life, animal and vegetable, that our eyes, unaided by magnifying power, can descry, is a mere point and parenthesis of Creation. Perhaps the comparison may be reasonably hazarded that the world which lies, so to speak, on the other side of the microscope may bear no inapt proportion to that which lies beyond the Telescope; that the little interval between the two on which we stand — the world of *Sight* in which we live—is a sort of central point or table-land, lying half way between those two unfathomable abysses of creative power, each to us, till lately, invisible. We know on the one side, from the microscope, that there are living creatures so small that *millions* of them exist within the compass of a square inch: we read only last week of the discovery of one animal even of the vertebrated class, that is endowed with a complete system of brain, and spine, and nerves, the jaw bone of which measured less than the hundredth part of an inch. On the other hand we read of systems of starry worlds so inconceivably distant that whole firmaments similar to our own are detected by the telescope, lying like a remote sprinkling of star-dust through the dark spaces that only the best instruments penetrate between the close-packed jewellery of the Milky-Way. Surely these dazzling and bewildering portions of creation may in no unreasonable, though in a different sense, be claimed as belonging to the Invisible World.

But there is one item of that world greater than all the rest—perhaps greater than all the others put together; one which as it is the most glorious so it shall be the last of all that I shall name; one little thought of, little valued in our happy days, but whose sovereign and sublime existence has handed down to us all that is most precious, most worth living for upon earth. I speak of that proud and blessed invisibility which protects, and has through all the ages of the world protected, the secret and inviolate processes of Human Thought. O! what would not the tyrants who in all ages have been allowed to scourge mankind, to imprison the body, to fetter the feet, to manacle the hands, to cut out the tongue, to destroy the eyesight, to deface God's human image, with every ingenuity of torture and infliction,—what would they not have given to be able to penetrate that inner chamber, and seize upon its priceless and peerless occupant, the independent power of untold Thought! True it is that the most present and permanent blessings are the least thought of, the last to be justly appreciated; but who is there that has not felt within himself the conscious sovereignty of invisible unfettered Thought? In vain has Despotism fined, tortured, and imprisoned; in vain has Superstition bent the unwilling knee, or exacted forced professions and reluctant creeds in every age; erect and independent, unapproachable by any scheme that hatred, cruelty, jealousy, or the utmost machinery of evil ever could contrive—safe, sacred, and secure upon its throne within the impregnable soul-fortress, has sat the power of Thought, smiling at the foes without, whose deadliest artillery of persecution could never reach that inviolate casemate, in which the title-deeds of human freedom, the patents of soul nobility, the maps and charts of human progress have been handed down, the indestructible and imperishable heirloom of the human race! Who does not feel a thrill of triumphant satisfaction at the short but pithy utterance of the great Tuscan astronomer-artist, who, after the absurd mockery of a forced renunciation of his doctrine of the diurnal motion of the earth, quietly uttered as he rose from his knees, the re-assertion—'*E pur si muove!*' 'In spite of all your persecution, in spite of the Inquisition's torture, and even the Pope's *decree to the contrary*, the earth *does* move upon its axis, notwithstanding!'

And now let me ask you to pause with me a moment and look back over this portion of the Invisible World that we have traversed, a portion so insignificant compared with its real extent, around us, about us, and within us, that I should have shrunk from the attempt to touch upon it even as cursorily as I have done, but for the sake of the deductive object which I have had in view throughout. For it was not to read you a lecture on science, still less on all the sciences we have glanced at, that I have addressed you. My object lies beyond this. What I want to bring impressively before your notice is the reflection, how vast a portion of what we call—sometimes almost contemptuously call—the Material World, lies utterly out of our sight—invisible! We have seen that the Air we breathe and each of the gases it contains are each and all *invisible*—that the one the least abundant of them all, though the source of all the vegetable matter upon the face of the earth and all the coal-beds under it, is *invisible*; that the heat or caloric which results from its combustion, although it has the mechanical property of loosening the molecular attraction of (that is, expanding) the hardest and most solid bodies, is *invisible*—that Ammonia, on which the manure we put upon our fields mainly depends for fertilising power, is like its constituents, nitrogen and hydrogen, *invisible*—that Steam, the great motive agent manufacturing and locomotive of our day, is *invisible*—that Electricity, whose speed may be said to vie with thought itself (except when its path is developed by obstruction), is *invisible*—that the Colours of the Solar ray are in their native undivided state *invisible*—that the forces of the Magnet, positive and negative, attractive and repellent, are equally *invisible*—that the two worlds, both perhaps alike infinite, which the Microscope and Telescope have revealed, were, till these inventions brought them to us, *invisible*—and last, not least, that the operations of the brain in the act of Thought (for science has shown that not even the muscles of the body perform their part with more distinct organic function than the brain)—this too, the ever-active empire of thought, is, to crown the list, *invisible.*

In a word, then, by far the greatest part of what we call the natural or material world, all that is greatest, most powerful, most *enduring*, and has most influence upon our health, our physical and mental enjoyment, and even our very existence, belongs in fact to the Invisible World. But if this be so, and I think I have shown you that it is so, what becomes of the doctrine that only '*seeing* is believing'? What then becomes of the sceptic's challenge, 'Show it to my eyes, let me handle it with my hand, and I will then believe it.' If it be found to be *the rule,* that all the chief ministering agents of creation are invisible, what must That Hand be, that originating and sustaining Power, which created *them?* If all these mighty yet subordinate powers are found working together harmoniously and beneficently to us, though for ever hidden from our eyesight, what must be the goodness of that UNSEEN HAND whence flows all this invisible harmony—screened, as it were, from our gratitude by the veil of a natural world, itself invisible, which thus *indicates* the yet deeper shrine, *beyond!*

How we love and venerate the earthly hand which in the smallest matters 'does good by stealth!' What may we not feel towards *that* hand whose greatest kindness every discovery of advancing science shows the more to be hidden from our grosser senses!—and surely, in the same degree, more exquisitely inviting to the eye, which searches after the evidence of *Things Unseen,* and to the heart that, warned by the mock-solidity of a world which exists only by change, strives for an enduring reality and repose in the substance of things hoped for! I do not wish to press you to one atom more of direct conclusion than your own free thoughts suggest; but if the habit of the servant be any token of the Master, if the language of the book be any evidence of its Author, if the type and character in which it is written be fair to argue from, to the finger of Him who wrote it, surely the analogy which nature in her *invisible dress* affords is full, uniform, and most suggestive; surely there are lessons perhaps exceeding the limits of language to express—to be found in the study of THE INVISIBLE WORLD!

ADDRESS

TO THE

WARWICKSHIRE NATURAL HISTORY AND ARCHÆOLOGICAL SOCIETY.

In venturing to comply with the desire of the Council, that I would offer the Annual Address to the Society, the pleasure that I have felt has been not unmixed with a sense of anxiety, how far, amid the range of topics comprehended in the wide subject of Natural History, my own studies and views might be such as to afford matter of general interest to those whom I address, and how far I might thereby hope to succeed in my principal object, that of promoting the valuable purposes of this Institution. But I have allowed myself to rest assured in the analogy, that as in the history of the outward events of life, it has been said there is scarcely a single biography that might not afford some matter of instruction, so in the inner world of the mind, there is scarcely a track that accident or purpose can strike out, in the various pursuit of knowledge by mankind, which may not chance to furnish some trifling quota to the common stock of information, some offering, in which perhaps the very individuality of our different tastes and perceptions, though often leading us to shrink from and stifle the expression of them, may really form the distinctive feature, giving to them their chief comparative value.

The beautifully varied field of Physical Science is open to all. No dogmatic teacher, self-appointed, or conventionally accredited, can say to the rising tide of inductive knowledge, 'So far shalt thou go and no further,' or lay down this or that limit of assertion or inquiry, for final and universal acceptance. The humblest chemist may correct the oversight of a Davy or a Liebig, the most unpretending florist may find a new exception in the classification of a Linnæus, the most unknown explorer of the heavens may discover what has escaped the search of a Newton or a Herschel,—and no man is staggered at his presumption, if the announcement be sincere, and the discovery abide the test of fair critical investigation. We have lived to see that towns *are* lit with gas, though the great parent of Chemistry himself laughed at the idea; and steam-vessels *do* cross the Atlantic, though the learned Encyclopædist of Modern Science drew the most elaborate conclusions .to demonstrate that it could never be. In a word, let our individual advancement be what it may, in natural science we are all but learners—and very young ones too: for when we consider the duration of the recorded period of the human race on earth, and contrast with it the dates from which hang all that we name our greatest discoveries in the properties of matter,—in the powers of the elements around us,—there is hardly a reflecting mind which does not feel that amongst all the wonders of advancing science, the greatest wonder, the most startling fact, is, its own infancy; the recent birth, I may almost say, of physical knowledge.

Out of sixty centuries and a half, take away but the last half century, and what becomes of Chemistry, that science little yet understood or valued at its true importance, which dissects and explains to us the simple elements and constitution of all the matter we behold—of every existing substance which reaches our perception, by the aid of the bodily senses—of everything we can touch, taste, or see? where again would be geology, which investigates the structure of the globe on which we live and move; which step by step interrogates the solid rock, and chronicles its place in the history of creation, by the evidence enclosed, not without a meaning and a purpose, in its successive layers of once living creatures, now lying in monumental forms more real than sculptured effigies, and affording by the regular series they present of fossil anatomy and osteology, a complete sketch of the rise and progress of organic forms of plant and animal antecedent to the date of those which now exist on earth? Where again would be that analytical history of organized matter, which we call vegetable and animal physiology; or where the practical application of the powers of that mysterious and subtle agent which we know under the triple name of electricity, galvanism, and magnetism?

Strike off but one century more from this end of the roll of time, and what becomes of the great discovery of the law of gravitation, and the whole consequential history of that relation which connects our planet with the other bodies of space, and their own relations with each other? or to descend to a subject of the closest interest to our own bodily frames, what would become of that now familiar adjunct of the medical art—the knowledge of the circulation of the blood? and again even within the last few years, the accurate investigation of the cause of animal heat?

I need scarcely refer again to the achievements of that giant of modern growth, the child of Fire and Water, which with equal ease can drive a vessel of two or three thousand tons against wind and tide, or spin a thread with a touch more delicate than the human thumb and finger; whose influence upon the future history of human civilization it is as difficult to calculate or conceive, as in the fifteenth century it would have been to predict the effects to be wrought upon the future world by the printing press or the mariner's compass.

When we lift our eyes around us and see the accumulation of results by which we are surrounded in the realized form of those accessaries to human comfort and enjoyment, those means and appliances of life, which one or two centuries of scientific discovery have supplied, it is impossible I say not to be struck, on reflection, with the still more startling thought of the ages upon ages that had passed when such things, as yet, had no existence, when human life, as yet, was naked of them: and it is only by doing so that we can form a just appreciation of the high privileges of that age in which our own experience is cast.

I know not if this reflection have found a frequent place in the minds of those whom I address, but I would claim a moment's indulgence for it, as a thought whose continually recurring and deepening interest seems freshly awakened by every page of the earlier histories of mankind, and every new discovery in art or science which marks the present, or seems to cast its coming shadow from the yet hidden future. I would claim indulgence for it, on an occasion like this, because, in the midst of all the busy progress made around us every day in the researches of science, by each toiler absorbed in his own pursuit, it is convenient and useful sometimes to take our stand as it were between the past and the present, and attempt to measure how far, and in what way, our own moral as well as physical condition is affected by the changes which the last two or three centuries, at the most, have wrought upon the condition of the human race, in so far as relates to our connection with the universe around us. To the child that is born this year, when arrived hereafter at the age of reflection on such subjects, the instantaneous transmission of thought by the aid of the electric telegraph, or that grateful discovery of a chemical agent which mercifully suspends the action of the sensor nerves during a surgical operation, will afford no more matter of surprise than we experience at the contemplation of that new hemisphere of the globe, the idea of which was ridiculed as the wild dream of a Genoese adventurer, four centuries ago. The paradox of one age becomes the truism of the next. Matters of daily astonishment to us will be mere historical facts to our children, the absence of which as part of the stock of common knowledge or ordinary conveniences of life, will be to them as difficult to realize, as it is to us to imagine navigation without the compass, or war without gunpowder.

It is to meet this somewhat idle acquiescence of each age in the enjoyment of the inventions and discoveries that have so recently anteceded it, that the pages of History have always appeared to me to hold a fresh and peculiar value as a companion to those of modern science. Indeed there is an analogy between the early history of nations, and the first dawn of science which has of late attracted a deserved remark. It is impossible to read the first few pages of the early annals of our own or any other country, without finding ourselves in an atmosphere of mysterious obscurity and vague guess-work, in which imagination steps back into the dark void that lies beyond the reach of authentic fact or tradition, and summons up images into its morning twilight, so life-like and real, that to shake them off afterwards, at the bidding of critical investigation, is like parting with old friends remembered from our childhood.

And so it is in the early history of physical science. The wizard, the alchemist, and the astrologer, are to modern science, what the Heracleidæ and the Argonauts, the kings of Rome, and the knights of Arthur's Table, are to our most familiar histories. To banish them would be to rob nature of that becoming mantle of mystery and superstition which after all was but the figurative and prophetic herald of those more substantial marvels that as yet lay hidden in the womb of future discovery. How commonly do we remark to each other, that let the artist dash on his lights and shadows how he may, a real sunset outcolours him; let the poet or the novelist conceive what fiction he please, the romance of real life outherods his extravagance. Man can *conceive* nothing, but Nature supplied the elements of the design. His most outrageous monsters are but natural forms newly or incongruously associated. *Desinat in piscem mulier formosa superne*—the monster figured by the Roman poet, like the more modern type of the mermaid, is but a combination; and Nature can supply the parts as easily for every conception that has issued from the dream of Fancy or Superstition. Horace's sketch of the muttering witch of Vesuvius,—reproduced by Lytton Bulwer—Scott's exquisite portrait in 'Kenilworth' of the astrologer-alchemist, seeking the philosopher's stone in vain, and discovering what he never sought; and again, the 'Cunning' or 'Kenning Man' who figures in old English stories, imposing on others and half imposing on himself a vague belief in his own powers over the elements,—are all the embodiments of our *intuitive anticipation of the real power of mind over matter* to be afterwards and gradually developed, and of which we now see many a fulfilment far more wonderful than the types which dimly pre-figured it. And as in going backward towards the earliest dawn of science we exchange the candid and explanatory facts of the experimental philosopher, the chemist, and the astronomer, for the dark words and signs of the wizard and the fanciful horoscope of the astrologer; so in historical retrogression we exchange the learned and painstaking accuracy of the modern annalist for the black-letter page of the monkish transcriber; and further back still for the half-effaced inscription of the Scandinavian or Celtic monument or the hieroglyph of the Egyptian priest.

They are but, in fact, the two phases, the outward and the inward phase of man's history on earth; the history of mind, and the history of action: and it is not difficult to detect in them an interesting and tolerably exact analogy. The enlargement of the sphere of ideas occasioned, on the one hand, by the successive great discoveries of science, and on the other by the extension of territorial knowledge and interest, commencing from the primeval kingdoms of Asia through the whole successive string of Grecian and Macedonian, Roman, Gothic, and Saracenic conquests, may, indeed, be called into relation with each other by analogy alone; but when we come down to the fifteenth century, an actual combination of the two begins to present itself, in which mere analogy is lost in the merger of a closer union. In the invention of the art of printing—followed by the discovery of America—an enlargement of the empire of thought and information on the one hand, and a physical extension of territorial exploration and acquaintance on the other, began to co-operate simultaneously in such a manner as must ever render it difficult to distinguish and allot to each their respective influences upon the progress of the human race. Their joint effects were sufficiently attested in the century that succeeded; a century of such wholesale revolution of human sentiments as well as events, as finds a parallel in no other period of the world's history; and which, while the developing operation of mind upon matter may be a continuing problem on earth, will ever stand out as a monumental period exhibiting the best instance of the counter-influence of matter upon mind.

It would be difficult to deny that a certain ripeness of unconnected causes may have contributed to the distinction of that extraordinary epoch; indeed it is always a difficult and a curious question how much of accident—if there be such a thing—may have contributed to the development of those occasional periods of combined activity which history seems here and there to present;—periods in which a confluence of events and circumstances seems to have suddenly marked,—like a burst of chimes,—particular hours of the world's age, leaving their remembrance more lastingly imprinted on the mind. Be the various causes what they might, it would be hardly a metaphor too strong to say that the history of the sixteenth century, when looked on retrospectively, is like that of an awakening world. In England, in Portugal, and in Italy, the genius of poetry burst again at once upon mankind in the minds of Shakspeare, Camoens, and Tasso: the foundation-stone of practical philosophy was almost cotemporaneously laid by the 'Novum Organon' of Bacon—a work which, whether regarded as a rescript of forgotten doctrines (as recently contended), or an original assertion of a self-evident, though dormant, truth, remains equally stamped as the vindication of the only true structural principles on which the edifice of science can be reared.

The excited fancies awakened by the discovery of a new hemisphere of the globe, the magnitude of which extending from the northern nearly to the southern pole, men could hardly bring themselves to believe or comprehend, naturally impelled the more adventurous spirits to great enterprises; and the voyages of Drake and Raleigh, and the accounts brought home of seas and lands hitherto undreamt of in the world's philosophy,—these voyages, whether successful or unfortunate, reacted on imaginations already aroused by what had been made known at home in the world of letters and of science. Thus at this extrardinary period of poetry, philosophy, and political advancement at home, and of discovery by sea and land abroad, every circumstance conspired to favour a general and widely-spread development and enlargement of the sphere of thought and perception. It is almost impossible for us, highly privileged and favoured as we may be in scientific discovery, to realize in the present age the revulsion of human sentiment which must have marked the course of that century. And yet what is its distance from us, compared to that long period which preceded it, under the title of the Dark Ages? What the three hundred years which have since passed when contrasted with the long roll of centuries which fill up the previous lapse even of the Christian era? But it so happens with the mental, as with the natural eye, that objects removed beyond a certain point of vision cease to convey to us any idea of their comparative distance. The ray of the remotest star finds a home and a welcome on the eye of childhood as unquestioned and familiar as the bright cloud that is red at sunset; though the difference of their respective distances could only be expressed by numbers so vast that the mind is unable to conceive them, even were they within practical notation. And so it is with The Past, in matters of science as well as history. We are born into a ready-furnished world, and we complacently avail ourselves of the comforts and advantages that lie ready to our hand, little thinking through what a travail of human thought,—encountered and renewed through successive ages,—through what repeated conflicts with human prejudice and persecution we have inherited many of the most ordinary appliances of art, and most of the important data by which our own researches after new knowledge are furnished or facilitated.

I believe that every member who was present at last year's meetings of the Field Branch of the Society will admit that I am appropriating no vain or rash compliment to it in congratulating it upon its progress and the heightening interest of its transactions. I think we have done wisely in assembling at last, at a winter meeting, in order to enjoy a review (to which the contrast of season brings additional force) of the warm, sunny holidays of summer; the cheerful and healthy rambles through new and varying scenery; the broken and lost country paths, where every blunder of the way aided the purpose of exploration; and, by disclosing some object, or eliciting some remark, made the loss a gain. Perhaps we are too apt to undervalue the accidents of Nature—that beautifully-dishevelled array—that 'discordia concors,' in which she presents herself to the inquiring eye of the Naturalist. It is necessary to keep reminding the indoor student that the jealous divisions of natural knowledge into distinct sciences is the work of books. It is their office and their duty; but we should use them as servants, not as masters. Nature is all one—indivisible though infinite; and, so to speak, innumerable. It is the limitation of our faculties, not of anything in Nature herself, that compels separation of pursuit and subject, and subdivision into chapter and verse. This is more powerfully felt, though vaguely and insensibly conveyed to us, by one day out of doors, surrounded by men of science (however each may have wisely compressed the channel of his studies in a special direction) than it ever can be inculcated by books themselves; and in this lies the special and felt privilege of these Field Meetings. If man be the 'Interpreter of nature,' here we are at the very shrine of knowledge—all high priests, if we choose to become so—ministering to, and necessary to, each other; for the very limitation of our faculties to special paths of knowledge becomes the self-evident bond of natural union between mind and mind—between man and man. The narrowness of our capacities—this element of our weakness, displays itself as a source of power in compelling union.

For I am not one of those who think that knowledge puffeth up. I hold the diametrical opposite of that idea; and believe there never was a greater heresy in the world of secular truth. It is ignorance alone that can exalt a man's knowledge in his own estimation. And, I make bold to say that, whoever has met with that strange phenomenon—a really learned and clever man, proud and boastful—has met with a chimera whose relative organization his eye misapprehends. The inflation, he remarks, is not in the learning of the man, but in the ignorance of the beast. 'With all thy getting, get understanding'—appeals most truly and most beautifully to the moral unity and reality of all knowledge—let me say of all true science. The Hand of Creation is not divided and at buffets with itself. 'Intellectual' and 'moral' are terms of our manufacture—the coinage of our poor mint, that can only strike one image and superscription at a time. It is not so in nature. There is no antetype to be found for any such separation there. We do not even know that matter itself can be dissociated from its effects upon the perceptive faculties of the mind any more than on our outward senses;

much less can the impressions and operations of the mind, which knowledge generates, be divided off and kept apart, and labelled 'intellectual' and 'moral,' except in the mere nomenclature of language, as the physiologist professes to divide the names and functions of those vital organs of our bodily structure, which we well know to be co-ordinate in their functions and coessential—in reality inseparable.

The realms of natural science are so boundless—its structure so indivisible and perfect in itself, that the tiny threads by which we strive, each upon his own small tract, to trace out the parts of the great pattern, furnish, as we climb them, the best of al antidotes to self-conceit. At every step the path widens—the horizon opens—the breadth and complexity of the pattern increases—'alps rise on alps, and the scale of creative power outgrows the reach even of imagination to follow, till to know that we indeed know nothing is the only formula in which the petty thing that we call knowledge can measure or express itself.

Yet more and more, at every step, does it become not felt only, but demonstrably certain that it is our duty to discover, and, as we discover, to promulgate truth. Truth is knowledge; and the more ample our knowledge, the better can we adjust and arrange it in the direction of special ability, and, ultimately, of general happiness. Let no one distrust for a moment the utility of any branch of natural science because his own finite powers cannot look *over to the other end* of it. What did the discoverer of the galvanic circle or the magnet foresee of an electric telegraph encompassing the globe? What did the botanist, who first examined the pods of the cotton-plant, foresee of its immense applicability to the clothing of mankind, and of its influence on the commerce and the political relations of the world? What did the first labourer in the path of physiological classification foresee of that ancient history of the globe we inhabit, to which the fossil application of his science would presently afford the clue?

In such pursuits every individual member of the great human family has an interest. The prompting motive is not self-love alone; nor is it only that benevolence which impels us to promote the good of others; nor yet that mixed feeling which urges us to do good to others because it gives pleasure to us—that enlightened self-love which every reflecting mind will comprehend and appreciate. Besides these motives, there are the faculties and powers through which we are attached to the natural world by our very conformation, as a *part of it* ourselves; whose special office it is to discern and appreciate the fitness and harmony of things, to recognise and teach, that human *Nature* is progressive, that its *proper* mundane state is that most perfect state of physical, intellectual, moral happiness, to which benevolence, enlightened by knowledge and directed by wisdom, can advance it. To see it in ignorance, and in consequent degradation and vice, is not painful only to the moral feelings, but revolting to the reflecting faculties; because we know it to be due to the obstacles which ignorance interposes—to the misdirection of error and of prejudice.

The experience of life and things more and more confirms me in the assurance that the boundaries of physical science—its end and aim and application to human good, have been narrowed and misunderstood—circumscribed by erroneous conceptions of its relation to the higher parts of our nature. The simply utilitarian objects, commonly attributed to it, are the mere body—the *corpus vile* of its uses. The results, with which we are privileged to be cotemporary, ought to teach us this lesson.

I would, therefore, in conclusion, ask the members of our club to regard the objects and the hours of their field meetings—few, comparatively, and far between as they must be, as moments of important and responsible purpose. There should not be an object of science, or of archæological interest, unexplored in this county, which abounds with both;—not a plant, or a pebble, or a rock, nor a place of interest un-noted and un-classified. It is the local duty and birthright of those who have the capacity and the leisure to perform it. We have railroad maps, and ordnance maps, and geological maps; but there is a map, still wanting, which shall rescue every spot of scientific, or historic, or archæologic interest from the obliterating hand of time, and the equally-injurious oversight of forgetfulness, unappreciation, or ignorance. This is our task. It has already commenced; and I earnestly invite everyone who hears me, and I ardently look, myself, to its accomplishment.

AGRICULTURE.

It is an observed characteristic of those sciences which relate to the material creation, that they cannot advance individually without throwing fresh light upon each other. An unpremeditated unity of result is ever disclosing itself, as in the growth of the coral-reef, or the honeycomb, as the consequence rather than the purposed object of the labours of each toiler in the various fields of human knowledge; and in proportion to the value and utility of each pursuit, will generally be found the collateral aid derived from other branches of advancing art or science, and the acceleration eventually produced by united efforts.

In the case of Agriculture we are familiar, in almost every treatise on the art, with an opening announcement of its antiquity and of its importance to mankind. But if, as it would seem, the antiquity of an art affords no measure or criterion of its advancement, the assertion in this case of primeval origin conveys little more significance to the mind than if made of the earth itself, the subject of its operations: and the reiteration of its importance without fresh evidence, or a fresh exemplification from that already existing, affords no perception beyond what experience has long furnished, and habit rendered familiar.

Applauded from the earliest chronicled ages as the first of arts, agriculture had reached our own, perhaps the least advanced of any, by direct scientific investigation. *Laudatur, et alget,* the terse expression of the satirist, might be taken as its truest motto, and its antiquity and importance be asserted in no very triumphant tone; for if both be, as they always have been, admitted, its history, compared with that of other arts from the earliest ages, seems only to present the greater anomaly to the mind of the enquirer. If we trace the progress of what are called the physical sciences, those for instance of astronomy and geometry, from the early days of Egyptian learning, or the history of navigation and commerce from the Phœnicians, the fine arts from the age of Pericles, the art of war, and colonisation, from the Romans, mathematical science from the age of Saracenic conquest, or follow the course of advancing knowledge in Europe, from a point no farther back than the invention of printing,—it is impossible to escape the unfavourable comparison exhibited by that very pursuit whose universal necessity, while it affords the strongest incitement to progress, might reasonably be expected to have exhibited the fullest development of its resources.

It is the marked popular distinction of reason, as compared with instinct, that it is progressive in its manifestation and effects, both in the species and the individual. The nation, or the child, beginning from however low a point, each presents the phenomena of intellectual growth: while the brute, and the whole brute creation, remain stationary. How unaccountable, that an art so peculiarly forced upon the energies and intelligence of man, by his first physical wants, and opening so many avenues of scientific enquiry, should, till of late years, seem to present an analogy rather with the latter than the former! The astronomical knowledge of an Egyptian priest of the earliest age, compared with that of a Newton or a Herschel, is consistent with the phases of infancy and manhood; yet a comparison of the agriculture of ancient Egypt with that of England in the middle of the last century, might be made, with some apprehension, not only for the proportionate, but even for the absolute result.

It is, however, satisfactory to mark, that the force of this reflection is, in some measure, due to the actual progress exemplified by the history of agriculture in the present century; first in Scotland, and more recently in England. The awakening effect of so rapid a change as we have witnessed of late years, naturally suggests the enquiry, Why it was so long stationary before, or why the ordinary phenomena of human progress should seem excepted in the instance of a pursuit as natural and attractive to the mind as it is essential to our physical existence?

Some answer may perhaps be found in the very importance of the subject itself. All nature seems to testify to the slow comparative growth of whatever is most truly and permanently valuable. The tardy maturity which is required for durability of material in the vegetable world, the growth of the time-defying oak, for instance, presents an analogy that can hardly fail to strike the mind, as indicating a law susceptible of wider application, and seems to offer some explanation why 'the best model of a ship or of a plough is even to the present day a subject of speculation and controversy.' We are indeed familiar with the diversities of opinion which exist among mankind, even upon elementary points, in subjects of the very first importance: what religion is to man's moral nature, and what political science is to his social being, it might be expected that the primordial art of the cultivation of the earth should be to his physical wants and condition; and that it might accordingly be handed down from one generation to another, still apparently in its infancy, and still susceptible of new light and improvement from each discovery that is made in the remotest branch of natural science.

But other and more tangible causes have operated to retard the *accumulation* of agricultural knowledge: one is to be found in variety of CLIMATE. This, which from the earliest time has been the primary basis of commerce, has operated otherwise with agriculture. The easy labours of the Egyptian husbandman when the subsidence of the Nile left his lands enriched, and almost cultivated without the aid of art, afforded little of practical information to the cultivator of Thrace, or of Sicily and Sardinia, the respective granaries, in later times, of Greece and Rome; nor would these in their turn afford much of accumulated and transmitted knowledge, when in the progress of civilisation towards the more northern parts of Europe agriculture encountered changed aspects and influences of the very elements themselves that qualified almost to gradual reversal, the details of practice, under the altered preponderance of heat and cold, drought and moisture. If the adoption in northern latitudes of the architecture of Greece and Rome present a sense of incongruity, through the feelings caused by difference of temperature, the solecism would, one might naturally expect, be still greater in an art so dependent as husbandry upon the elements of soil and climate: and the gradual elimination of *principles* from its practice under given conditions, was thus arrested at every step, as these conditions were found to vary.

The modifications of practice occasioned by climate on a large scale have been again repeated over smaller areas by VARIETY OF SOIL. Not only does the agriculture of a southern temperature vary materially from that of the north, but even in the same country and province the code of practice which would apply to a light soil would be immediately at fault when attempted on a clay: and thus, the GEOLOGICAL STRUCTURE of the earth, again subdivided by DIFFER-

ENCE OF ELEVATION, occasioning effects analogous to those attributable to latitude or climate, would all tend, as we find they have done, to retard that codification of results by which the edifice of a science can alone be reared.

Another impediment to the accumulation of agricultural knowledge, will be recognised in the condition of existence which the life of the agriculturist has usually implied. The farmer is, by the very nature and exigency of his pursuit, more or less localised and isolated. The influence of that mental attrition which is produced by congregation of numbers, as in towns, is to a certain extent denied to him from his earliest years. The mere etymology of the words urbanity and rusticity, seems to convey the whole argument. Art, the child of necessity, is mainly advanced by emulation; and principles are deduced from comparison: but emulation and comparison are alike shut out, where the mere physical impediment of distance arrests the habitual operation of the perceptive faculties, and consequently deadens the activity of the mind. We are even in the present day familiar with the fact, that the most unquestionable improvements and recommendations are frequently met with denials of their applicability to this and that particular soil and district, which if respectively true would in the aggregate negative them upon all; and the most injudicious practices are on the other hand defended, upon the score of local suitability, on soils of the most opposite description.* And this common cause of retarded improvement will have been generally found to operate more powerfully according as population was more thinly scattered. Indeed, it is only after that period in the history of a country, when numbers have begun to throng, and resort is had to inferior soils, that agriculture begins to assume the true features of an art, as requiring skill, and susceptible of improvement at the hands of science. So long as land is abundant, those spots only are selected for cultivation whose natural productiveness requires the least application of labour; and the character and produce of such soils remaining as the *exemplar*, the history of the art only commences with the occupation of land below these in the scale of fertility. As recourse was had again to soils still inferior, we should expect to see the art advance, as its appliances are successively exacted by the wants of an increasing population: and such has in fact been the case, wherever the course of events has given it free development.*

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* 'The sowing of artificial grasses,' writes Jethro Tull in 1740, in the notes to his preface, 'was so long before it became common amongst farmers, that though Mr. Blythe wrote of it in Cromwell's time, yet thirty years ago, when any farmer in the country where I live was advised to sow clover, he was certain to say, "gentlemen might sow if they pleased; but they (the farmers) *must take care to pay their rent,*" as if the sowing of clover would disable them from paying it: and now the case is so much altered that they cannot pretend to pay their rent without sowing it, though the profit of it is vastly less since it has become common, than before; and the improvement, after all, was no more than doing the same thing on this side the water that was done before on the other.' The well-known story of the Duke of Bedford and the ploughman, mentioned in the admirable *Introduction to British Husbandry,* is an amusing illustration of the same point.

But even under the pressure of increasing numbers, advancing intelligence, and the utmost comparative uniformity of soil and climate, another retarding influence clogs the wheels of agricultural progress: namely, the length of time needed for experiment. A main cause of the brisk advancement and general spirit of improvement observed in other arts and manufactures is to be found in the rapidity with which, in their case, effects follow causes. The advantage of a simpler or more compendious process is at once seen in result; and the invention is speedily applied by others who are interested in its adoption: but such could hardly be hoped for in the case of an art where each question that we ask of nature takes a year or more for its solution; and upon which no ordinary degree of exact memory, patience, and co-operation for experiment, are required, even to put them in such a manner as to render the replies serviceable or conclusive. Experience has shown, too, that the great pioneers of improvement in each art have not usually been those who have been drilled from the first in the rank and file of its mercenaries. The greatest improvers in agriculture—and the remark is not peculiar to this pursuit—have been for the most part those who have brought to bear on it the analogies and perceptions derived from other arts: a class of men of whom Middleton remarks, that they often 'form the most intelligent and accurate of husbandmen. Like converts in religion, they have more zeal and fewer prejudices to surmount, than those who have been brought up in it from their infancy: their indefatigable attention makes more than amends for their ignorance of minutiæ; and having been at the pains to acquire a knowledge of the theory of their new pursuit, they establish their ideas on rational principles.'*

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* 'There are but two possible modes by which the produce of the earth can be increased: one by rendering fresh land serviceable; the other by improving the fertility of that which is already cultivated. The last is only attainable by the application of capital and skill to agriculture, neither of which could be expected in the ruder ages of society. The former is, to a certain extent, always practicable while waste lands remain; but it was checked by laws hostile to improvement, such as the manorial and commonable rights in England, and by the general tone of manners.'—HALLAM, *Mid. Ages*, iii. 366.

Yet though exalted powers of perception, supported by indefatigable zeal and labour, have enabled individual minds to overthrow and reconstruct the received opinions of mankind in particular departments of human knowledge, this could only happen where the results achieved by intuitive genius or great inventive powers could at once make apparent and attest their own truth and accuracy. A Newton, a Hervey, a Columbus, a Watt, or a Bacon, might each revolutionise, in the span of a single life, the opinions of mankind, upon the great subjects of their respective inspiration; but it was scarcely within the compass of a single mind to achieve discoveries of corresponding magnitude, in an art whose experiments reach over periods which exhaust human life for their solution, and refer to the whole catalogue of the sciences for the principles on which they depend.

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* *View of the Agriculture of Middlesex.*

> Pater ipse colendi
> Haud facilem esse viam voluit; primusque per artem
> Movit agros, curis acuens mortalia corda:
> Nec torpere gravi passus sua regna veterno.
>
> * * * * *
>
> Ut varias usus meditando *extunderet* artis
> *Paullatim*, et sulcis frumenti quæreret herbam. *Virg. Georg.* 1.

Such are a few, and but a few, perhaps, of the reasons that might be adduced for the slow development observable in the history of agriculture, if indeed that may be called a history which of all great subjects of enquiry that exist offers least in the shape of a continuous record to the enquirer. It is eminently the art of the world's advanced age; its science is prospective: every day's addition to the population of a country enforces it upon human notice and intelligence with the repeated dint of daily necessity. Other sciences invite man; this importunes him. Remote as its earliest annals may be, it remains ever ready to receive fresh illumination from the gradual advancement of all around it; and as such it will probably reveal itself more clearly with every progress made by each art and science in their respective courses, but especially by that of its late-claimed parent chemistry. The lectures on the application of that science to the aid of agriculture, read before the Royal Society by Sir Humphry Davy, may be fairly regarded as the starting-point of its present course. Interesting as its previous career may be to every liberal mind as matter of historical curiosity, it can scarcely be regarded with higher practical estimation, in point of utility, than that in which we should hold the mechanical arts before the introduction of steam, navigation before the compass, literature before the invention of printing, or 'war before gunpowder.'

The birth of chemistry—a science which unfolds the constituent elements of all the substances of our planet, of its atmosphere, of its productions, and many of the phenomena of their *growth*—must, obviously to any reflecting mind, afford an epoch from which all analytical progress in agriculture must take its date. Whatever previous causes may have retarded its advancement, and whatever local or temporary circumstances may have operated in its favour, its practice must in either case be merely empirical, so long as its elementary and governing principles were in fact unknown. Its practical details were taught by fathers to their sons, and that kind of knowledge which precedes alphabets and sciences was of course available to this as to every other human pursuit: but with the first true knowledge of the simple substances of nature, their mutual action and relations, its real history commences, and that long reign of guesswork and mere routine is at an end, which has rendered the subject one of little scientific notice; or, on the other hand, of speculations and doctrines whose absurdity was limited only by the imagination or even superstition of the writer.

The works of antiquity which have come down to us bearing upon agriculture, seem to be of three kinds—poetical or pastoral pieces, exemplifying the advantages, and sometimes entering into the details of rural life, like those of Hesiod,* Theocritus, and Virgil; philosophical treatises like those of Aristotle,

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* The *Works and Days* of Hesiod tell us all we know about the agriculture of Greece, except what is incidentally to be gathered from the idyls of Theocritus and a few passages of Homer. Herodotus is singularly uncommunicative upon the subject: but a curious passage on a branch of Scythian *Farm-practice* may be found at B. iv. c. 1, 2, 3. The silence of the Sacred Records leaves us uninformed upon the ancient agriculture of the Jews, and the nations surrounding them. Flocks and herds are everywhere prominently noticed as the common measure and evidence of wealth; but the subject of *cultivation* seems throughout the writings of antiquity to be regarded as beneath the dignity of special remark.

Plato, Xenophon among the Greeks, Cicero, Pliny, Cato the Censor, Varro, Columella,* and Palladius, to which, we are told, may be added the names of Hiero, Attalus, and Archelaus, kings of Syracuse, Pergamus, and Cappadocia, and of Mago the Carthaginian, who is said by Columella to have written *twenty-eight volumes* upon the subject; and thirdly, in more modern times, books of set rules, professing to be founded on practical experience, and prescribed often with minuteness, the more ingeniously assumed in proportion to the absence of all real principle or positive experiment; a description of writing sufficiently warranting that 'disgust at the very idea of *Book-husbandry*' so warmly expressed in Arthur Young's 'Farmer's Letters.' 'The publication of experiments, really made, faithfully related, and sufficiently authenticated, is of great and important consequence to the public good: but the very reverse is the case of these books which are published under the title of General Treatises and Systems, comprehending more soils, articles of culture, &c. than any one man can experimentally have a knowledge of; consisting of the most heterogeneous parts, purloined out of former books on the same subjects, without a common knowledge to discover the good from the bad. It has been said several times, and with very great justice, that what we want is a *Book of Experiments.* If any practical intelligent husbandman, who occupied a farm, would only keep an exact register of all his business, such a collection would form, as far as it extended, a complete set of experiments. What we have are the author's reflections, instead of that which enabled him to reflect; and from which we might draw very different conclusions. *The Experiment is Truth itself*: the author's conclusions, matter of opinion which we may either agree to or reject according to our private notions.'

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* The treatises *De Re Rusticâ*, of Varro and Columella, are the most complete; but little information is afforded by the Roman writers of the biography of earlier agriculture. Yet, the well-known story of Cincinnatus, and the agrestial etymology of some of the patrician names, as *Fabii*, *Pisones*, *Lentuli*, *Cicerones*, &c. indicate no low estimate of an agricultural genealogy (*Pliny*, xviii. 1). Columella tells us that the patrimonial estate on which Cincinnatus employed himself consisted of *four acres*. Livy says, that Romulus, in his distribution of the land allotted *two* acres to each citizen; and that after the expulsion of the kings, it was increased to seven.—*Pliny*, ib. *Livy*, v. 30.

Such are the truthful remarks of an author whose own works afford perhaps the best example that exists of what the pen of recorded experiment and resulting thought and principle could do for agriculture. He wrote at a time (1768) when England was a large exporter of corn, under a Government bounty; and when, as we are told by Harte, Canon of Windsor, the able author of the 'Essays on Husbandry' (quoting in this instance from a contemporary French financier, M. Dangueille), Britain could, in a fruitful harvest, produce corn enough to support its inhabitants *for four years.*

But if the treatise writers upon agriculture of that class alluded to by Arthur Young have added but little to its scientific advancement, the scanty records that have reached us of its practical progress as an art, have been still less instructive. The further we go backward in exploring its early history, the more rapidly the darkness closes around us as we attempt to penetrate beyond those points where one science after another began to throw faint gleams upon the humble labours of the most neglected and uneducated part of the human family.

In our own island, a maritime colony from Gaul, which had settled along the southern coast, attracted the only agricultural notice of the Roman invaders;*

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* There is little reason, however, for supposing that the Romans were ever themselves much advanced in agriculture. The predial servitude of the classes to whom it was entrusted,

and the rest of the country is described as a waste, either of uninclosed pasturage and hunting ground, or covered with vast tracts of forest and unproductive coppice. That during the nearly four centuries of their occupation of the island, they introduced all the knowledge of agriculture which could be adapted to its climate from their own, may be concluded from their usual habit of engrafting their customs upon conquered nations, and receives attestation from the remains that exist to the present day of their almost monumental roads, and other labours of a people advanced in art and civilisation. In the construction of these roads, though carried out in a great measure by the soldiery, the natives were compelled to labour. Tacitus introduces it as part of the indignant complaint of Galgacus, the Caledonian leader, that his countrymen were worn down by their oppressors in clearing woods and draining marshes, under the Roman lash. This receives confirmation from a passage in Camden,

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besides operating as a bar to its improvement, amounts to a moral evidence of its backward condition. 'In the agricultural economy of Rome, the labouring husbandman, a menial slave of some wealthy senator, had not even that qualified interest in the soil which the tenure of villenage afforded to the peasant of feudal ages. Italy, therefore, a country presenting many natural impediments, was but imperfectly reduced into cultivation before the irruption of the barbarians.'—HALLAM *Mid. Ages*, vol. *iii. p. 365.*

who, in speaking of these Roman roads in Britain, describes them as running in many places through drained fens; in others, as raised over low valleys, and paved to a sufficient breadth for the passage of two wagons abreast. A still more significant evidence of the improvement of British agriculture under the Romans would seem to exist in the account, if authentic, of the supplies of corn sent from hence to the granaries of Rome, in addition to that which must have been required by the legions quartered in this country.*

The incursions of the Picts and Scots, after the

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* Mona, a name confusedly applied to both the Isle of Man and Anglesea, was called 'the granary of the western provinces.' [See Dr. Johnson's *Essays on Agriculture.* The first of these essays was originally published in the *Universal Visitor* (Feb. 1756), and is by some attributed to Smart the poet, who had a hand in that publication. The second is allowed to be undoubtedly from Dr. Johnson's pen.] Strabo tells us that the Britons, though they had plenty of milk, were ignorant of the art of making cheese. Cæsar states that, from some superstitious feeling, they refrained from eating the common fowl, the goose, and the hare; and Xiphilinus adds to the list of self-denials all kinds of fish, though they abounded in the lakes and rivers. It is hard to say what degree of confidence may be placed in these, perhaps, hasty generalisations, either from local practices or questionable reports: though the short notices found in the Commentaries of Cæsar may in general be regarded as those of an eye-witness.

Roman secession, the purely warlike character of the first Saxon and Danish settlers, followed, after the lapse of two centuries of heptarchal feuds and disunion, by the general confiscation consequent on the Norman Conquest, present a bristling succession of predatory and warlike periods, in which the mind finds scarcely a resting point for any speculation connected with the arts of peace, except what is afforded by the single reign of that early hero, alike of war and peace, the great Alfred, the supposed founder of our county divisions, and probably of the general land-boundaries, afterwards adopted in the records of Domesday Book. This extraordinary relic which, perhaps, for the best of all reasons, its own intrinsic utility, has survived the shock of centuries, to realise the antiquity and history of the very fields we cultivate, presents to us an inexhaustible fund of interest and conjecture, charged, though it has been, with something more than accidental inaccuracy. Its elaborate survey and enumeration of the cultivated lands of the kingdom is such as even in the days of ordnance maps and trigonometrical surveys, we cannot regard without a degree of surprise proportioned to our conception of the difficulty of such a work, in the rude age of the Norman Conquest, and at a time when the whole population of the kingdom has been computed at little more than a million and a half of souls.*

As the Britons were ignorant of the use of so simple an instrument as the Flail, so it has been asserted as an instance of the backwardness of a later agriculture, that the Harrow was unknown to the Saxons: the supposition is mainly founded upon its absence from all paintings and illuminations of that date. But the assumption upon this negative evidence is rather doubtful, and the fact scarcely conceivable. The Romans were quite familiar with it: and no subsequent decay of agriculture could easily explain the loss of an instrument which they must undoubtedly have used in Britain, if they did not introduce it. That it may not have been as commonly used as the wooden plough of those days is quite possible, by reason of its more complicate form, and the greater need of iron in its manufacture. Its omission from pictorial evidence may perhaps be explained on the ground that it is less symbolical than the plough, and the delineation of it offers to the artist a somewhat elaborate problem in perspective; causes which might occasion its absence in the few specimens of rude art which have come down to us from our Saxon ancestors.

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* Turner, *History of the Anglo-Saxons*, vol. iii. p. 252. Mr. Turner's mode of making the calculation is somewhat arbitrary. He sets down the number of persons mentioned in Domesday Book at 300,785, and multiplies by *five*, as the average number of the family belonging to each; but a large portion of the kingdom, including the counties of Cumberland, Durham, Westmoreland, and Northumberland, and the towns of London and Winchester, and all the monastic population, are entirely omitted. Sir James Macintosh has endeavoured to correct this estimate. But the data are too obviously insufficient to furnish even an approximate accuracy.

Its appearance upon the border of the Bayeux Tapestry may be taken as conclusive of its being familiarly known upon the Continent at the time of the Conquest; and had there been any re-introduction of it into England at or after that date, it is hard but that the circumstance would have found mention favourable or otherwise, according to the leanings of the monks and chroniclers, Norman or Saxon, whose praise or abuse of the usurping race have each involuntarily afforded many historic details of the period that would not otherwise have reached us.

War and the chase, the two ancient and deadliest foes to agriculture, occupy too prominent a place in the history of the Norman kings who succeeded the Conqueror, to afford much scope for industrial progress; and the story of the New Forest, with other instances of tyrannical devastation in the northern parts of the island, imitated on a smaller scale by the feudal barons on their own wide fiefs, warn us to pass on to a later period in search of the scantiest materials for an agricultural survey of our history. 'The excessive passion for the sports of the field,' says the acute reviewer of the middle ages, 'produced those evils which are apt to result from it; a *strenuous idleness* which disclaimed all useful occupations, and an oppressive spirit towards the peasantry. The devastation committed under the pretence of destroying wild animals, which had been already protected in their depredations, is noticed by several authors, and has also been the topic of popular ballads. What effect these must have had on agriculture it is easy to conjecture. The levelling of forests, the draining of morasses, and the extirpation of mischievous animals which inhabit them, are the first objects of man's labour in reclaiming the earth to his use; and these were forbidden by a landed aristocracy, whose control over the progress of agricultural improvement was unlimited, and who had not yet learned to sacrifice their pleasures to their avarice. . . . . . Yet, even in the least civilised periods, there were not wanting partial encouragements to cultivation; and the ameliorating principles of human industry struggled against destructive revolutions and barbarous disorder. The devastation of war, from the fifth to the eleventh century, rendered land the least costly of all gifts, though it must ever be the most valuable and permanent. Many of the grants to monasteries, which strike us as enormous, were districts absolutely wasted, which would probably have been reclaimed by no other means. We owe the agricultural restoration of great part of Europe to the monks. They chose, for the sake of retirement, secluded regions, which they cultivated with the labour of their hands. Several charters are extant, granted to convents, and sometimes to laymen, of lands, which they had recovered from a desert condition.' *

Yet it cannot be denied that, subject to such occasional exceptions, the art of husbandry in Europe under the rude sway of her northern conquerors, in the early centuries of the Christian era, was perhaps nearly at the lowest ebb that it has ever seen at any period of recorded history. The savage and warlike habits of the tribes that, like a dark hail-storm,

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* Hallam, Middle Ages, vol. iii. pp. 265, 435.

drifted over the wide confines to which centuries of more enlightened conquest had extended the empire of Roman civilisation, were little calculated to encourage labours which a barbarous pride taught them to hold in contempt as beneath the necessity and dignity of warriors, who could make and hold their purchases with the sword.* Agriculture, accordingly, abandoned as a servile employment to the reluctant labours of serfs and boors, fell into a state of general decline and disrepute; and it was not until the period of the crusades that a new counteracting influence gradually rolled back once again the influence of early civilisation, not yet extinguished around the borders of the Mediterranean. The effects of the crusades on agriculture, though slow and indirect, are traceable through two cooperating causes; for while the absence of the feudal chiefs tended to relax at home the iron grasp of tyranny, and to lighten the fetters which bound the serf or villein as a burthen, not an improver, to the soil, there came back, in every warrior who had the good fortune to return, an eye-witness of the advantages derived by the then possessors of the Holy Land, from the progress they had made in a school of husbandry which has scarcely had a rival in previous or later times.

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* The story of Earl Warrenne, who, when asked to show his title-deeds, silently unbuckled his sword and laid it on the table, describes in a single incident the genius and character of 'Feudal Tenure.' Amidst all which has been so retentively clung to, of Norman laws and usage in relation tolande d property, it is a pity that their only wholesome feature—*simplicity* both of Title and Transfer—is the one which modern practice has abandoned.

The career of improvement which followed the rapid conquests of the Saracens in the East, during the 10th and 11th centuries, forms indeed one of the most brilliant episodes in the industrial history of Europe, and received its first impulse from the taste which they soon developed for agricultural pursuits. Imitative rather than inventive in their national character, they adopted, with skilful application, whatever was useful or profitable in the habits of the countries which their extraordinary and extensive victories enabled them to occupy: and pressing onwards from the east to the extreme west of southern Europe, they bore along with them, like some broad and irresistible stream, into new countries the seeds of ancient art and knowledge, which bore fruit no longer in the worn-out soil afforded by the elder seats of human civilisation. Egypt and Persia, the earliest of the Arabian conquests, were also the primeval seats of husbandry and tillage; and here the native disposition of the conquerors found ample scope for improving the labours of the field into the character of an art, by careful observation of the skill and practices of many subject nations. The artificially watered plains of Syria and Persia soon attested the laborious ingenuity of this remarkable race of conquerors, which was afterwards carried to perfection in the kingdom they established in the Spanish peninsula, where the art of husbandry attained a perfection before unknown, and (except in Holland and the Netherlands) afterwards unparalleled in Europe. By the skill they had acquired in *irrigation*, the first great requisite of southern agriculture, as *drainage* is in the north, the Spanish Arabs and their apt and emulous followers, the Moors, created a new era in European husbandry; and even to this day in the provinces of Grenada and Valencia, the traveller, amid scenes of modern indolence and apathy, is often reminded of the enterprise and skill of the indefatigable race that has long passed away, leaving monuments of their industry in the vestiges which still remain amid the fertile but neglected districts of the Peninsula. Canals, reservoirs, and aqueducts were carried with unremitting skill through every district where such aid was required in furtherance of the labours of the cultivator. The most useful of the medicinal as well as agricultural plants of Asia and Africa were at the same time introduced, and naturalised for cultivation, together with the indigenous products of southern Europe. Some idea may be formed of the extent and practical results of the labours of this remarkable people, whom the early minstrels and chroniclers of Christendom have handed down to us only as a race of savage infidels, from the fact that, in the reign of Abder-ahman III., the revenue of the Saracen kingdom of Spain amounted to about six millions sterling,—'a sum,' remarks Gibbon, 'which, in the tenth century, probably surpassed the united revenues of all the Christian monarchs.'

During the period extending from the reign of Edward I. to the Reformation, a large proportion of the fens in Lincolnshire, of Romney marsh in Kent, and of the fen lands in Somersetshire, were scenes of the most active and meritorious efforts, on the part of the religious houses, to drain them and improve the soil. Somner, in his discourse concerning Roman Ports and Forts in Kent, produces a charter of marsh land by Phlegmund, Archbishop of Canterbury, of so early a date as from 889 to 915 A.D., and there is no cause to think even this the earliest. The practice of rescuing land from the sea by *warping*, as it is now called, as well as by the building of mounds and walls, seems to have originated with the monastic houses; of which we have evidence to this day in the names of successive Archbishops of Canterbury, as Becket's, Baldwin's, Boniface's, &c. attached to different portions of the Kentish marshes recovered during their prelacy. The monastery of Glastonbury had acquired large possessions in the fens of Somerset, and made improvements on the largest scale, in draining, and the construction of dykes and sluices to carry off the waters which overflowed the adjacent lands, and carrying causeways of stone and gravel through what had previously been impassable morasses.* Another early instance

* Hasted's *Kent*, vol. i. p. 239. Elstobb's *Bedford Level*, p. 32. Campbell's *Political Survey*, vol. i. p. 333. Billingsley's *Somerset*, &c. Some idea of the produce obtained from the soil in the time of Edward I. and II. may be derived from a remark of the learned Fleta,* who observes that the farmer could pay no rent, and must himself be a loser, if he could not obtain *six bushels* from an acre. This low return was probably caused in a great measure by the enormous disproportion of arable land to pasture. Sir John Cullum mentions, that in the parish of

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* Book ii. ch. 8.

of improvement, by enclosure and drainage, is recorded in the example set by Ingulfus, the spirited Abbot of Croyland, who lived under the Conqueror, influenced by whose example, the inhabitants of Spalding came to a resolution to partition and cultivate their marsh lands, which soon proved to be of the most fertile description.[*]

The monks were, in fact, not only the most advanced agriculturists, but the first landlords, in the

Hawsted there were thirteen or fourteen hundred acres of arable, and but forty-five of meadow; and in almost every report that has come down to us the same disproportion appears.[*] It is, however, to be borne in mind, that, from Domesday Book downwards, pasture land is often omitted altogether, or entered with that disregard to accurate measurement which is still observed in the case of sheep-walks or mountainous districts in Wales and Scotland; which, though forming the most extensive part of a manor, frequently do not appear in the surveys. The difficulty of estimating the comparative value of money makes any record of the amount of rent paid for land at those periods a matter in which the most accurate calculation may lead to very uncertain results. It is mentioned by Hearne that an acre was called *solidata terræ*, because the yearly rent of one on *the best land* was a shilling. From some passages in Blomefield's *Norfolk*, Mr. Hallam infers that the average rent was not above half that sum, though meadow land was valued at double or treble.

[*] See Hallam, Mid. Ages, vol. iii. p. 439. 1 Gale xv.; script. p. 77.

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[*] Cullum's *History of Hawsted*, vol. ii. c. 8. Whittaker's *Craven*, pp. 45, 336.

best acceptation of the word. Connected by the ties of ecclesiastical dependence and intercourse with Rome, the seat at once of their supreme authority, and of whatever still remained to the world of art, science, and literature; and employed in the transcription of manuscripts, whose language was a sealed repository of knowledge to all but their own order, they kept alive the embers of past learning and civilisation, which were otherwise threatened with utter extinction: and though the practical knowledge of husbandry offered by the georgical literature of Greece and Rome might be scanty, it may be readily conceived that its mental influence would be more or less perceptible over the lands of proprietors thus comparatively enlightened, and of a tenantry exempt from military service, and encouraged by the secure and permanent tenure which these estates enjoyed: whilst, on the other hand, the great lay proprietors, regarding war as the real business of life, the chase as its chief pleasure, and the alternate rapine engendered by intestine feuds, and the necessary support of a body of armed retainers, as the common liability of their condition, present a picture, interesting indeed to the eye of romance, but the most unfavourable and discouraging that can be well imagined, to a pursuit in which security as well from exaction as from depredation, joined to independence and self-reliance, are the essential conditions of industry.

It is true that a considerable quantity of *allodial* lands remained, unshackled by the law, or lawlessness, of feudal tenure. 'But what guarantee had the proprietor for quiet possession? A number of small landholders found themselves surrounded by mighty chieftains, whose estates were extensive, and whose power was increased by the number of vassals they gathered about them through the practice of subinfeudation. In an age when the spirit of justice was scarcely known—when law furnished no shield of protection—the freeholder was constantly exposed to the oppression of his haughty neighbours. If some feudal baron cast his eye upon the field of the allodialist, it was vain for the proprietor to resist. It was better to yield it up to him at once as a feudal estate, and to occupy it as a fief incident to certain services, than to have it taken away altogether, or even subject to hostile depredation and pillage. Besides, in seasons of anarchy and war, when foreign enemies invaded a kingdom, or rapacious lords issued from their castles to gather a harvest of spoil, the possessor of an independent estate felt that if he would keep what he had, it would be better for him to put himself and his estate under the wing of feudalism, and thus secure the only kind of protection which the times afforded.'*

The effects of that uninterrupted fixity enjoyed, amongst other advantages, by the occupiers of church-lands, offer the strongest evidence, if any be needed, of the importance of certainty of tenure to the well-being of the agriculturist. But the evidence of that truth receives a yet higher confirmation from the counterchange which the lapse of a few centuries has brought about in the case of those very tenures which furnish the comparison. Short terms of years, with fines on renewal, which contrasted with the contemporary system of feudal villenage, were amongst the main stimulants to the superior cultivation of church-lands, and led to the accumulated wealth of the ecclesiastical body, have now, by their retention in the face of an improved system of tenure on the other side, reversed the contrast, and exhibit an opposite picture of comparative progress. Nothing shows more strikingly the ephemeral nature of all human institutions, however good in original adaptation, than the instances of this kind which history furnishes as a beacon to warn the legislator of later days to steer by the light of its philosophy, instead of hugging the altered landmarks of its ancient charts.

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* Glimpses of the Dark Ages, 12mo. p. 128.

The rapid change of hands and subdivision of property occasioned by confiscation and other causes, during the long struggle between the rival Houses of York and Lancaster, detrimental as those ruinous conflicts may have been to the immediate interests of agriculture, eventuated in a loosening of the bands which had before tied up the means and spirit of improvement. 'The nobility and gentry who took part in the conflict were obliged to commute much of the personal services due by their tenants, for rents in money, in order to meet their expenses in the field. Many bondsmen were thus emancipated, and acquiring, together with their release from servitude, an interest in the soil, which they had not previously possessed, applied themselves with more earnestness to its cultivation. The estates of many landholders were either dismembered to pay off mortgages incurred during the long continuance of that civil strife, or falling at their death to collateral heirs, were divided amongst a much greater number of proprietors, who, severally drawing their subsistence from a smaller portion of land, were necessarily compelled to devote more attention to its improvement. The increase of population, and the charter granted to corporate bodies, swelled the number of inhabitants in the towns; and markets, which had not previously existed, were opened for the produce of the country. Although leases had been long customary, yet they were voidable by the sale or alienation of the land, and the tenant's property was even subject to the debts of his landlord; but both of these abuses were rectified by the statutes passed in 1449 and 1469.* Thus the dissensions by which England was agitated throughout the greater part of the fifteenth century, gradually contributed to the amelioration of her civil institutions, and gave rise to that middle order of society to which much of its prosperity in the succeeding ages is to be attributed.'†

In the course of the sixteenth century, the light which was beginning to dawn upon mankind soon began to produce a perceptible effect upon agriculture. Several causes conduced to this result in England: the cessation of intestine struggles on the marriage and accession of Henry VII. affording the blessing of a long peace to the kingdom, the gradual abolition of the system of villenage, of which we find the last statutory mention in this reign; the slow but awakening influence of the invention of printing in the previous century; and most important of all in its immediate results, the steady increase of population, which, according to the calculation of Mr. Chalmers, had in the middle of this century reached about five millions. Perhaps of all effective causes in the history of agriculture, population is the one to which we may direct our attention with the most watchful interest and assurance of results. Whatever may be the ultimate effects of moral and intellectual advancement, the most direct agents of man's first progress towards civilisation are to be found in his physical necessities. As mouths multiplied and annually increased their demands upon the produce of the earth, the eye of the historian may follow, without a check, through the gradual extension of tillage and the application of fresh labour to the soil, towards that period when accumulated wealth gives birth to more systematised art, and by a better economy of human labour enhances the ratio of that progress from whence it took its origin. The northern and western parts of the island were at this time by far the most backward in cultivation; but in the east and south the more active interest taken in agriculture by the landlords, who began to feel the necessity of increasing revenues that were become inadequate to the drains of civil war, and the equally expensive luxuries of peace, produced a necessary extension of cultivation. The dismemberment of those large baronial estates which had previously taken place was followed by a rapid and somewhat remarkable inverse action, in the consolidation of small farm-holdings into larger occupations. As estates diminished in size, farms increased; and the extent to which this was carried is seen in an Act passed so early as the fourth year of Henry VII., which forbids *the demolition of any farmhouses having twenty acres of tillage annexed to them.*

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* By the former of these statutes the tenant was secured in possession, against a new purchaser, during the period of his lease; by the latter his property was protected against the debts of his landlord beyond the amount of rent due. What can more significantly than these two statutes attest his previous miserable condition?

† Introd. to Brit. Husbandry, U.K.S.

In the dearth of minuter or more satisfactory chronicles of the state and progress of the rural population, while no diligence or research can recover the forgotten history of a single village, the statute-book, with its incongruous prohibitions and interferences, often tells a significant tale. The one above recorded is symptomatic of the growth of a class of men whom the preceding feudal ages never knew. Accustomed as we are to judge of those days from works of fiction, or historians who dwell chiefly upon the embellishing occasions of tournaments of princes and nobles, we acquire a habit of transferring to the yeomen of those days the social stamp and lineaments of the farmer of the last or present century. Nothing can be further from the truth pressed upon the mind by historical accuracy. Whether in respect of personal freedom, wealth, or independent condition of life, the comparison is equally faulty. The slow elevation of that class whom the feudal system of polity had so long depressed,—of the people, as distinguished from the small number of rich and noble,—was not commenced in the rural districts, until its first causes had gradually taken root within the walls of corporate towns. That middle class to which the modern farmer of from one to three hundred acres may be generally regarded as belonging, is not to be traced by any known and existing feature, even to the middle periods of the history of our country; nor can we with any truthful foundation indulge the pleasing vision of a continuous parallel extending back even to the fifteenth century, of the present relation implied in the words landlord and tenant.

It can afford us no surprise to find that as tillage was extended over soils previously in a state of rude pasturage, the actual produce per acre should also be found to increase upon land already in cultivation. Yet it is difficult to suppose the accuracy of the account presented in the description of England prefixed to Holinshed's 'Chronicles,' where we are told that the average produce per acre of tillage lands throughout the kingdom was from sixteen to twenty bushels of wheat or rye, thirty-six of barley, and four or five quarters of oats. Whether the subsequent enclosure of less fertile soils has reduced the general average, or whether the want of intrinsic acquaintance with husbandry matters, in the annalist, may have involved some inaccuracy in the account, it can hardly be reconciled with the comparison which would arise, upon the hypothesis of the present average produce of the kingdom, with that even of the last century: be this, however, as it may, the statement offers an evidence of agricultural improvement, which, partaken as its effects must have been by the whole community, supplies a very intrinsic and explanatory source to the general advancement of national happiness and importance which marks the reigns of Henry VIII. and Elizabeth. It is mentioned by Hasted that, in the latter reign, no less than fifty-three large tracts of land, in the county of Kent alone, were disparked and brought under the plough;* a story which, though scarcely intelligible in a literal sense, gives general evidence of the gradual recovery of the country from the impolitic legislation which had for many years postponed the cultivation of the soil to the more favoured wool trade.

The history of this once grand staple of English commerce furnishes an early experience of the distorting influence of legislative interference with the regular course of agricultural industry and trade. A law had been passed in the fifteenth year of Henry VI. forbidding the export of corn whenever the home price was above 6*s.* 8*d.* a quarter; a point no doubt above the average at the time of the passing of the statute, but which the rapid increase of the commerce of Europe generally at that period, and the free and augmenting exports of wool from this country, together with the increase of wealth and luxurious habits, had a natural tendency to antiquate. In vain was statute after statute passed to forbid the conversion of arable land into pasture, and to set a limit to the immense flocks of sheep, sometimes amounting to twenty thousand, in the hands of single individuals. The preponderating scale was not to be adjusted by laws directed against effects. The seat of the mischief which was swallowing up the tillage of the country lay in the unrepealed statute which had confined the corn trade to the home market. Fortunately, however, for the makers, as well as the subjects of human legislation, the most impolitic acts are the least permanently efficacious of their own ends: the restricted exportation of corn, by the advantage it conferred upon the rival wool trade, and the consequent reduction of tillage, eventuated in producing a succeeding cycle of that dearness of price it had been framed to prevent; and the recoiling impetus thus given to cultivation, far more than the teeming legislation for agriculture which marks the reigns of Henry VIII. and Elizabeth, gradually corrected the disturbed balance; and probably laid the foundation of that extended produce which a century and a half later presents to us in the altered picture of England become a large corn exporter, under the opposite financial error of a government bounty.*

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* Hist. of Kent, vol. ii. p. 271.

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* See Young's *Farmer's Letters*, II.

From the Elizabethan period down to the present time, if the further development of agriculture has been unequal and irregular, as well in its own cycles as in comparative local progress, the inestimable permanency of printed records has at least given to the subject some degree of historical continuity. Confined as the utility of printed treatises must have been, in proportion to the rare capability of reading them, even amongst classes less remote from their influence and empirical in their habits and practice than the cultivators of the soil, they yet stand out like ancient landmarks of inestimable value to the enquirer of a more recent age, as self-speaking contemporary evidences, instead of that system of conjecture and inference, provoked rather than supplied, by the scanty memorials of the whole antecedent period of social and industrial history. And while the existing amount of practical information they disclose of their several periods is such as to forbid any vaunting sense of our improvement in this art they afford a series of views interesting in the highest degree to every mind that owns a satisfaction in tracing the progress of his own country and of mankind at large in those pursuits which extend the operation of mind over material nature, and carry out with involuntary obedience the divine command written in the very instinct of man to 'replenish the earth and subdue it.'

The name of Sir Anthony Fitzherbert, a lawyer and a judge, has been handed down as that of the father of agricultural literature in England. His 'Booke of Husbandrie,' one of two connected treatises which he has left, sets an example worthy of imitation in the very outset, wherein he certifies himself *a farmer of forty years' standing*, as his qualification for the task proposed; an assurance which would have a somewhat startling effect, from a Chief Justice of the Common Pleas in our day, when the progress of society has narrowed more and more the attention and labours of men to single objects and pursuits, and the 'division of labour' principle has fenced off with greater strictness the several departments of human industry, rather perhaps to the advantage of the work produced, than to that of the mental habit engendered in its production. The fund of analogical power and breadth of view derived from the acquaintance with subjects not directly related, afford a liveliness and vigour of style to the old writers, which we can more rarely hope to meet with in proportion as the progress of society necessitates the subdivision of men's study and experience over smaller allotments; unless indeed the storing of conclusions drawn from a more discursive acquaintance in the field of science—a task not without its own specific utility—may become a necessary and distinct pursuit. To whatever point agriculture could aspire previous to the Alternate System, and the application of analytical chemistry, 'the Booke of Husbandrie' was competent to advance it. Nothing that has since appeared upon the subject has equalled it in expressive brevity or surpassed it as a text-book for the time. Condensing his subject into the space of a hundred pages, with a terseness hardly to have been anticipated, unless indeed for the humour of a contrast, the *learned* agriculturist has almost exhausted the subject, which, as regards English writings, must have come to his hands almost a maiden task. The prevailing bad practices which he points out and the improvements he commends, might some of them even at this day be referred to by the agriculturist with a truth and advantage, little suggesting the suspicion that the lecturer had flourished three centuries ago. The practice of leaving deep stubble to be mowed, at leisure, late in the winter, when gradual oxidation has deprived it of nearly all its organic matter, and left little more than the ash remaining, to carry to the farmyard, he reprobates with all the zeal and true perception, if not with the scientific phraseology, of an adept in agricultural chemistry. Another deficiency even of our own day in the poorer arable districts, where its remedy is the most needed, he calls to mind in the pregnant warning, 'a housbande cannot thryue by corne without cattell, nor by his cattell without corne;' adding, 'shepe in myne opinion is the most profitablest cattell that any man can have.'

His notice of the common employment of marl reads a suggestive chapter on the important but backward subject of inorganic constituents, and the necessity of their restoration to the soil, as experienced at a time when the want of good roads almost reduced the transport of bulky materials to the pannier and the pack-saddle; thus preventing to a great extent the interchange of commodities, and that great element of agricultural prosperity, an easily attained market, steadied by the wholesome operation of a wide area of demand and supply.

Judging from the little mention of lime by Fitzherbert, its use would seem to have been still rare in his day. A writer of the previous century, Whitaker, mentions that the price of it close to the kiln was 'one third dearer *than that of oats*'—a singular comparison, but amply descriptive. The first Act of Parliament authorising the levy of turnpike tolls for the repair of roads was not passed until the year 1663, nearly a century and a half after Fitzherbert wrote.

With the obstacles of expense and difficult transport, to the conveyance of restorative substances to the soil at a time when the compensating influence of the alternate green crop was unknown or unpractised, and the head of winter stock consequently small, the exhaustion of fertility could scarcely have been met by the amount of manure produced upon the farm, had the produce sold by the farmer of three centuries back approached to anything like that with which we are at present familiar; and a sufficient explanation suggests itself of the immense extent of that practice to which the marlpits remaining in many parts of the kingdom to the present day, bear ample testimony. Permanently valuable as the application of marl must always be found to those soils which, from their peaty or sandy nature, stand in need of both its main constituents, lime and clay; its extensive use in districts where, from the natural heaviness of the soil, it could only act as a bulky substitute for lime, may well afford some astonishment at the labour encountered by the farmer.

The quaint but not uninstructive doggerel of Thomas Tusser, a musician and a sort of agricultural poet, is the next literary effort which has come down to us. His 'Five Hundred Points of Good Husbandry' are an attempt to clothe in short ryhmes, for easier remembrance, every point of practical detail which a farmer should know; and their general truth and utility received the best of all testimony in the number of editions the work went through; yet the copies were found so scarce, and so worn and mutilated from constant use, by Dr. Mavor, who published an edition in 1812, that it was with great difficulty he could collect the whole work: 'a proof,' he remarks, 'that what was intended for practical use, had been sedulously applied to that purpose. The copies were passed from father to son, till they crumbled away in the bare shifting of the pages; and the mouldering relic only lost its value by the casual mutilation of time.' The best editions were those published in 1580 and 1585. The author mentions carrots, turnips, and cabbages, then recently introduced as kitchen herbs.

His work was succeeded after about thirty years by 'The whole Art of Husbandry,' from the pen of a writer named Barnaby Googe, who makes mention of several writers cotemporary with Fitzherbert, whose works have not descended to us. 'The Jewel-house of Art and Nature,' by Sir Hugh Platte, and 'The Surveyor's Dialogue,' by Sir John Norden—works nearly cotemporary with the preceding one—introduce us to the first mention of white clover, which the last writer advises to be sown *with other grass seed.* The introduction of the clover crop, however, which may fairly claim to form one of the epochs in agricultural practice, was due to the subsequent writings of Blythe, Hartlibb,* and Sir Richard Weston, about the middle of the sixteenth century. The latter writer having lived for some time abroad as Cromwell's ambassador to the King of Bohemia, published on his return a description of the Husbandry of Flanders and Brabant, and though the field cultivation of turnips, as food for cattle, is not expressly mentioned earlier than the year 1684, forty years after Weston wrote, there appears good reason to ascribe to him the foundation of the Alternate System of husbandry. Cromwell, himself a farmer in early life, was a steady and munificent patron of agriculture, and was fortunate in the aid of these cotemporary improvers who flourished during his protectorate; and though the civil disturbances of that period were not favourable to the arts of peace, the spread of letters and education, and the number of treatises that had gradually appeared, raised the practice of husbandry from the low condition it had hitherto held, to the notice of men of education; and before the end of the seventeenth century, the cultivation of green crops on the Alternate System had made some progress in the southern counties of England.

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* It is remarkable that in the writings of Blythe and Hartlibb, who reviewed the works of many previous agricultural writers, no allusion whatever is made to that of Fitzherbert. As Hartlibb, though pensioned by Cromwell as an agriculturist, was in fact a compiler of the works of other authors, his omission of the name renders it probable that he had never heard of the work.

But it was reserved to another century to witness the sadly interesting life of one who may perhaps be called the greatest individual improver that agriculture ever knew. The investigation of the PRINCIPLES of FERTILITY, the basis and groundwork of all purely agricultural speculation, seems hitherto scarcely to have been the subject of a continued experiment, however it may have begun to attract some degree of desultory curiosity amongst the learned and scientific.* It is not by a retrospect limited to the comparatively recent period of his own labours that we can form a just or adequate estimate of the benefit con-

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* Dr. Woodward's *Essay towards a Natural History of the Earth*, published in 1695, followed by Evelyn's *Terra*, had successively begun to call some attention to the abstract principles of fertility. The latter work, like that of Lucretius, which it often brings to mind, offers some of the most interesting specimens that exist of ingenuity and originality of thought, groping in the utter darkness of mere guesswork and speculation, before the very dawn of chemical and geological science. The following passage may be taken as a specimen:—'Those who have written *de arte combinatoriâ*, reckon up no fewer than *one hundred and seventy-nine millions one thousand and sixty* different sorts of earths; but of all this enormous number, as of all other good things, it seems they do not acquaint us with above eight or nine eminently useful to our purpose; and truly I can hardly yet arrive at so many. Such as I find naturally and usually *to rise from the pit,* I shall here spread before you * in their order. The most beneficial sort of mould or earth, appearing on the surface, is the natural under-turf earth; but for a description of the rest which succeed it in strata or layers, till we arrive at the barren and impenetrable rock, I shall refer the critical reader to the *old Geoponic authors.*' . . . .
'My Lord Bacon directs to the observation of the rainbow, where its extremity seems to rest, *as pointing to a more roscid and fertile mould*; but this, I conceive, may be very fallacious, *it having two horns or bases which are ever opposite.'—See Dr. Hunter's Edition, published* 1778.

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* The Council of the Royal Society.

ferred upon agricultural science by the genius of Tull. To any mind familiar with the common biography of art, the life of Jethro Tull exhibits all the phenomena which have usually marked the career of a great and original discoverer. Pursued by, as much as pursuing, one ruling idea, his errors and excesses, as they are called, are as instructive as his most successful experiments. The very failures to which they led, through causes unforeseen, tended to pare down and expose in its truer proportions the simple and fundamental principle, which he dimly saw, and only missed the full attainment of, by the want of a helping hand from that master-science, which the genius of Davy, Liebig, and others has since held out to later and more favoured experimentalists.

His theory was that the roots of plants live upon *minute particles of soil*; and the practice to which it led him was that of repeated tillage and pulveration during the growth of the crop. To effect this the more thoroughly, and at the latest periods of growth, he adopted the plan of sowing the seed in rows at wide intervals. The awkwardness and even purposed carelessness of his workmen, as he tells us, drove him to the invention of some instrument by which the seed could be delivered in regulated quantity and without deviation: 'to that purpose,' he writes, 'I examined and compared all the mechanical ideas that ever had entered my imagination, and at last pitched upon the groove, tongue, and spring, in the sound-board of an organ. With these a little altered, and some parts of two other instruments added to them, as foreign to the field as an organ is, I composed my machine. *It was named a* DRILL; because when farmers used to sow their beans and pease into channels or furrows *by hand*, they called that action *drilling*.'

The width of the intervals between the rows as thus planted, easily suggested the substitution of the HORSE-HOE for hand-labour; and it is thus worthy of remark, that in the instinctive prosecution of a principle which he never fully apprehended, two of the most valuable of modern implements of agriculture fell, by that collateral necessity which great truths bring with them, to the invention of a man whose modesty of nature, and humble appreciation of his own discovery, did not save from the common fate of the benefactors of mankind. The discoveries of De Candolle and other naturalists, in the science of vegetable nutrition, followed by the inimitable researches of Professor Liebig in organic chemistry, have since brought to light, step by step, the beautiful mystery, of which

Tull might be said (in the words of one whose name his own has sometimes called to mind) to have 'distinguished the form without seeing the face.' The deep and perfect pulveration of the soil was indeed, and is, the great secret of vegetable nutrition which he held it, and so far as the truth of a theory is borne out even by the blindest practice, the guiding instinct of Tull's genius had every test and evidence of its fundamental accuracy. It has been generally said that he carried his principle too far. The reverse is the truth. He did not carry it far enough; and it was exactly at the point where his theory halted that his practice began to fail. Had he known that the object of pulveration is the free admission into the soil of those two bodies, air and water, which together contain all the organic elements of vegetation, Hydrogen, Carbon, and Ammonia, the erroneous theory which led him to reject the use of Manure would (even apart from the consideration of its supply of inorganic constituents) at once have been abandoned. Perhaps amongst the answers that might be given to the question what chemistry can do for agriculture, there is none more complete than that which is furnished at once by the merits and the demerits of the Tullian husbandry. So far as his practice was in accordance, though unknowingly, with chemical truth, it was right; and at the point where he deserted it he went wrong. Whether some extenuation of his error does not yet await further discovery, is perhaps somewhat early to prognosticate; but the extending use of artificial fertilisers, and the conclusions long pointed to by the successful practice of paring and burning, induce a not unreasonable suspicion, that the vast expense attending the application of farmyard manure in its entire form is scarcely balanced by adequate benefit from the retention of the whole of the carbon which constitutes its weight and bulk.

The labour of the dung-cart, even in the most improved districts awkward and uneconomical, exhibits under more backward management a system of laborious extravagance and loss which a slight acquaintance with the attendant chemical results would render intolerable. By frequent turnings in the yard and long exposure in the field, every opportunity for the escape of the ammonia, and every toil in the lifting and hauling of the carbon, is liberally afforded; though it is matter of growing experience that the latter substance may to a very considerable extent be dismissed without important or perceptible loss; and that the former, united with the inorganic agents, presents the mainly efficient elements of that powerful absorption of carbon from the atmosphere, which it is the independent faculty of every plant to exert, with more or less activity and vigour according as the soil supplies the conditions of its development.

The partial error of Tull's theory of the nutrition of plants cannot, however, be fairly viewed except in conjunction with, and as opposed to, the husbandry practice of his day. His opinion that manure was only valuable as a divider and disintegrator of the soil, though arising in part from unacquaintance with the history of its chemical constituents, will be seen with less condemnation when compared with the then and still prevalent error of treatment and application of it founded on a supposition that mere bulk is an essential of its fertilising power. To this impression was due the surprise and incredulity evinced at the effects of guano, and the so-called 'artificial' manures on their first introduction. The gradual abandonment of the bare summer fallow, manured in autumn before wheat-sowing, and the increased cultivation of green crops which required the manure to be applied in the spring, gave fresh importance to the controversy which, in the absence of any means of chemical investigation, had always existed up to the time of Davy, as to the state of decomposition in which the manure should be applied to the soil. Every farmer was practically familiar with the fact that as decay proceeded, the bulk and weight of the manure heap diminished; yet it became the settled practice to allow this to go on to a considerable extent, where the manure was intended to be applied to the turnip crop. So far, therefore, practice had begun, as usual, to accommodate itself to true theory, before the principles were known. But the loss of the ammonia taking place at the same time with the decay of the carbon, it was soon found that there was a point beyond which decomposition should not be allowed to proceed. Practice had, however, seemed to establish that the later the time of its application, and therefore the more immediate its required influence on the growing crop, the greater the need that it should have been 'well rotted,' a term which began to find its way into farm leases and agreements as an essential condition of good manure. The want, however, of accurate measurement and combined observation and experiment, a thing so much needed but hitherto so little extended to practical agriculture, prevented the ascertainment of any fixed point of decomposition, and where theory itself seemed unsettled beyond the use of mere general expressions, the practice of course was arbitrary and matter of accident.

It was at this point that opinion had long stood, for principle there was none, as to the use and operation of manures, when, preceded by the rapidly increasing application of bone dust, the attention of agriculturists was invited by the extending researches of analytical chemistry to the scientific principles of vegetable nutrition. The idea was received at first with some hesitation, if not with ridicule, that by the simple incineration of a plant, its inorganic constituents might be at once exposed, and its composition virtually *prescribed* in a chemical formula, so far as those parts were concerned, to which in fact it owed its distinctive character. But the introduction of guano into partial use fortunately taking place about the time when the translation of the works of Professor Liebig had brought this doctrine into general notice, afforded a sort of ocular demonstration in its favour by the simple and convincing explanation derived from a mere comparison of the analysis of this powerful manure with that of the crops themselves usually cultivated by the farmer. On no other explanation than that afforded by direct analysis could the wonder be solved of a substance which, after numerous comparative experiments, was found equal in fertilising property to about a hundred times its weight and two hundred times its bulk of the ordinary manure of the farmyard. The economy of its application, as compared with the unwieldy nature of straw manure, occasioned by the presence of so large a mass of mere carbonaceous part in the latter, has naturally drawn equal attention to the other branch of Liebig's theory, if so it may be called, namely, the nutrition of plants from the atmosphere, and the question above referred to has arisen, how far the enormous mass of organic matter, which constitutes the chief bulk of ordinary manure, is, in fact, retained with an advantage compensating the labour it occasions.

Chemistry has shown that decay and combustion are the same process, differing only in the rapidity with which the union of carbon and oxygen is effected, that the same actual amount of heat is evolved in both, only with different degrees of intensity. The ploughing in of yard-manure, therefore, in bulk, if done previous to the long winters of our latitude, furnishes, during its gradual decay, the means of a higher temperature of the soil, and a protection to the young crop; and so far the old practice, of applying the manure after a bare fallow in autumn, was in part accordance with right principle. But when, on the extension of turnip husbandry, yard-manure came to be a largely increased winter manufacture, and its application to the soil a spring process, a new and unforeseen principle came into play. Its carbonaceous structure requiring a long period for decomposition, before the mineral and ammoniacal constituents were set free to enter into new combinations, rendered it inferior in immediate efficacy on the growth of the turnip or other spring crop, to manures which contained those elements in a disengaged form, ready for immediate action. The liberation of carbonic acid in the soil, by the decay of vegetable matter, was thus seen to be of little direct nutrition to the roots compared with the supply of inorganic elements and ammonia, in that form so admirably furnished by guano, and some of the artificial fertilisers suggested by its analysis. A cotemporaneous testimony has been thus afforded to the truth of Liebig's theory, by the facility with which the plant, sufficiently supplied with these parts of its structure in the soil, draws from the atmosphere rapid compensation for the want of carbon in the manure.

The successful practice of paring and burning affords an additional illustration of the truth of this theory. The portion of carbonaceous matter dissipated by combustion occasions no ultimate loss to the soil, because the active growth caused by the mineral salts released from combination by the process, enables the plant to re-absorb from the atmosphere in the growth of a single summer all the carbon which had been parted with; while the reduced bulk and pulverised texture presented by the ash furnishes the most convenient and soluble form in which manure can be applied to the roots of the plant. The method of late adopted of cutting into chaff the whole of the straw produced upon the farm, is a partial movement in the direction suggested by the same view. The reduction of bulk occasioned by the practice, together with the increased absorption of ammoniacal liquid, is followed by a third advantage, the more rapid decay of the carbonaceous part in the soil, by its minuter division; provided that all superfluous moisture were excluded, beyond that obtained from the droppings of the cattle, it is perhaps a near approach to the best form in which straw manures could be applied to the soil.

It is not, however, the object at present to enter further into the chemistry of vegetation than to exhibit that vindication of Tull's doctrine, which he only wanted the requisite analytical knowledge to express in correct terms. The truth which he saw, and only argued on erroneously, was that the soil might be made to supply all the conditions of vegetable growth without the direct supply to the roots of vegetable matter through that medium; in the language of agricultural chemistry, that if supplied with their inorganic elements by the soil, they have the faculty of obtaining the material of their organic structure from another source. Subsequent improvements in the implements of tillage, the well-known results of drainage and subpulveration, and, above all, the mere comparison of spade husbandry with that of the plough, in fact, every advance in the art of mechanical cultivation, viewed in reference to its chemical results, has afforded ample evidence of the general truth of Tull's theory. The victim of a painful and incurable disease, and harassed by the incessant attacks of an anonymous Society, who at once pilfered his discoveries and derided his experiments, he presents in his life and writings an instance of genius struggling against contemporary jealousy and calumny, which would be incomprehensible to posterity were they not the too frequent living reward of some of the greatest and most disinterested contributors to human knowledge and happiness. 'It is said,' he writes in a memorandum to his last publication, 'that mine is the first book of agriculture that has happened *to be pirated*; and that upon the first notice of it I ought to have desisted; because I could have little obligation to a country whose laws did not protect me in the property of my labour (the original foundation of property in most things), and of my expense that is joined with it. The best apology I can make is, that it is natural for the true parent rather to lose the property of his offspring, than not to endeavour to preserve the life and well-being of it, though in the hands of enemies.' He might have added to this apt allusion to the sacred narrative of the true and false mother, that if plunder, and ingratitude, are the contemporary award of genius, it is its nature and destiny to despise the one and to survive the other. 'What struck me most when I came to read Tull,' says his able editor, William Cobbett, 'was that all I had read before in later writers that had any principle in it, had been stolen from him. Born and bred amongst affairs of gardening and farming, I had read a good deal about them, but till I read Tull I knew nothing of the principles.'

It was a singular testimony of merit that his work was translated simultaneously by three French writers, unknown to each other. But nearly thirty years elapsed before his practice was at all generally adopted or understood, and this (through the instrumentality of Lord Belhaven, who had the merit of introducing it into East Lothian) took place in Scotland long before it was common in England. It proceeded, however, but slowly until about the year 1762. Mr. Dawson, 'a practical rent-paying farmer,' finally established it in spite of the distrust and prejudice with which even his adoption of it was at first regarded. The history of his success, as told in the Agricultural Survey of Northumberland, is the common history of agricultural improvements. 'When he first settled at Frogden, the whole of that district was under the most wretched system of management, and the farmers unacquainted with the value of turnips, artificial grasses, *or lime.* At first his practice met with many opponents, and was ridiculed by the old, the ignorant, and the prejudiced; but his superior crops and profits soon made converts—the practice in a few years became general, and this district is now amongst the best cultivated in the kingdom, the land trebled in value, and the aspect of the country greatly improved.'

But the whole history of Scottish agriculture from that period is, as Mr. M'Culloch has remarked of the rapid increase of its rental, from the year 1795 to 1815, 'probably unmatched in any old-settled country.' One of the oldest agricultural societies that we read of had been formed in that country so early as the year 1723, under the title of 'The Society of Improvers in the Knowledge of Agriculture,' from whose transactions, published twenty years afterwards, it appears that Lucerne and Sainfoin had been introduced into its husbandry, and that the Turnip, Carrot, and Cabbage had begun to supersede the bare fallow in the Lothians; and though limited in numbers, and able to produce little influence beyond that afforded by the example of its own members, it is to this patriotic body of men that we may trace the rise of the Highland and Agricultural Society in 1784, which laid the foundation of the early superiority of agriculture in the north, previously far behind the southern and eastern parts of our island.

A shoal of writers followed in Tull's wake, of whose contributions to the rapidly growing history

re it is the more difficult and unnecessary to speak in detail, from the transcendent merit of that 'man in obscurity,' as he called himself, when modestly scrupling to append to the title-page of his earliest work, the well-known name of Arthur Young. Singularly favoured in the period at which he wrote, when a general spirit of curiosity and interest in the subject, combining with political causes, had begun to direct the attention of educated men and capitalists to agricultural pursuits, his admirable 'Farmers' Letters,' Agricultural Tours, and 'Calendar,' displayed the mind and pen of a master in his art, and went far towards laying the foundation of a practical agricultural literature. Though his argument in favour of the then existing bounty on exportation of corn, and his hearty deprecation of the aid of chemistry, contained in the first-mentioned work, show him not quite above some prejudices of the day, which he probably survived, his writings soon became, and still continue, a standard reference for most of the topics of practical husbandry; and on the formation of the Board of Agriculture, under the presidency of Sir John Sinclair, in 1793, he was chosen as its secretary; and afforded invaluable assistance in the collection of accurate Agricultural Surveys of every county in the kingdom, a work of the utmost value, carried out by practical men to whom every source of information was open, and at a time when the extraordinary stimulus that had been given to agriculture by war prices and the unlimited issue of a paper currency (however subsequently injurious in an agricultural as well as a financial point of view) had caused the investment of capital in agriculture to an unprecedented extent, and developed every known means of extending and improving the cultivation of the soil. The task was executed with an accuracy and completeness proportioned to its immense value, and it is only to be regretted that before the dissolution of the Board of Agriculture, which took place on the conclusion of this work in the year 1813, the labours of its members were not directed to the collection, into a compendious digest, of the interesting but unwieldy mass of information that had thus for the first time been brought together. The self-illustration afforded by the varying practices of different soils and districts, in an art upon which mere Locality has always exercised so important an influence, is the most suggestive and remedial, if not the only practical form in which that information can be collected, upon which a complete code of agricultural practice might be founded. Since the establishment of the Royal English Agricultural Society, in 1838, every encouragement has, however, been given towards the attainment of this object, by the periodical publication of essays in the Journal of the society, upon the practice of each county in succession; from which it may be anticipated that this purpose will yet be achieved in a more perfect form, viz. the reports of persons locally conversant with the soil and practices of each district.

It has been above attempted to give a general sketch of the history of agriculture, from the earliest times down to the periods and people of most interest to ourselves; and to gather, with what succinctness the subject would allow, some notices of its biography and literature, as well as of the events which have retarded or developed its progress. In an art, whose records dwindle and diminish as we throw our gaze farther backward, till they vanish altogether, amid the wandering flocks and unfixed abodes of the early races of mankind, the practical value of such a retrospect scarcely repays very keen antiquarian research. We have witnessed, in our own day, the gradual but extensive adoption of a practice, that of under drainage, which may be said to alter the natural constitution of the soil itself, calling up a succession of minor improvements, the abandonment of the bare fallow, the deepening of the active soil, the increased facility and economy of cultivation, the more equable distribution of the labours of the year, the increase of winter food, of stock, of animal manure, and ultimately of cereal produce, all tending to the one great end, the support of increasing numbers upon a limited and unalterable space. It would be both unphilosophical and contrary to the conviction of every reflective mind, to suppose that the point we have reached, even in the most remarkable instances, is final, or indeed that as long as the race of man shall endure, such a point will ever be attained. No one has ever attempted to assign the *ultimate* produce, or value, of land, even of a single acre. The resources of the earth expand to the increasing want of its inhabitants. The history of many parishes and estates will show a produce quadrupled within the period almost of human recollection: but the demand does not slacken, nor the ratio of its increase. It will be useful, therefore, to take a brief review of the causes which in our own time have begun to reveal themselves in more or less active operation, as tending to promote the extension and improvement of an art whose interests, far from being confined to its mere physical purpose, are interwoven by links of a higher relation with our moral being, through that intercourse with nature, which is grateful to almost every mind. The backward and almost despised condition we have seen it holding in barbarous ages and countries, and in those transition periods of anarchy and tumult, through which the races of mankind have gradually emerged into various degrees of civilisation; and the after influences for good exercised upon it, by those very causes which seemed at first most injurious and depressing; the whole course, in fact, of agriculture threading its quiet way, mocked by the praises of poets and philosophers, while consigned in practice to the most despised and uninstructed of mankind, is pregnant with the promise of an eventual vindication of its suitability to the highest intellectual and moral condition of the human race. Each science in succession has welcomed and claimed kindred with it. Botany, vegetable and animal physiology, the sciences concerned with air, water, and steam, mechanics, meteorology, chemistry and geology—each, in turn, has paid tribute to it, and holds out the means of progressive instruction, only limited by the ability of the agriculturist to avail himself of their resources, until it has become more and more apparent, that scarcely any knowledge is superfluous to the tiller of the soil.

The varieties of Climate, of Soil, and of Altitude, to which we referred in the outset, as having in the earlier ages retarded its advancement, by discouraging conclusions drawn under so many different conditions, are now, in the advanced population and intercourse of nations, seen to be so many multiplied sources of security against the fearful consequences of uniformity of circumstance, under which an isolated nation or district is ever exposed to the alternation of dearth and superfluity. Under their inevitable influences the hand of Trade within, and of Commerce without, becomes subsidiary, through reciprocal need, and exchange, to the fellowship of mankind: and is thus seen to become a peace-maker and a law-giver, more powerful than could be offered by a legislative congress of nations: and the varieties of the earth's surface furnish one vast insurance to its inhabitants, that neither seedtime nor harvest shall wholly fail. The more diversified the experiences under which the art is practised, the more numerous become the data, and the wider the basis of the science, as the growing intercourse of men enables them to compare and generalise; and while later-discovered regions of the globe have successively furnished plants, vegetables, and modes of cultivation previously unknown to the old, these again, by the emigration of art and skill, have diffused over vast fields of almost virgin fertility, the seed and culture of grain crops destined afterwards to supply the deficiency which the diminished soil and thronging population of the mother country may present.

All this we have ourselves witnessed, as a thing of comparatively recent experience; and its continued operation is only less observed as a fact connected with the prospects of agriculture in consequence of the magnitude of the scale in which it acts. Its development has become so completely a part of the history of the world, that we listen almost with incredulity to the meagre list of vegetable and root crops cultivated, or even known by the agriculturist of three centuries ago; and the still more scanty enjoyment of articles of foreign growth and importation, which have long become ranked (like the Potatoe, for instance) with the oldest of our indigenous productions, as necessaries in our daily food.

Differences of CLIMATE, then, have but delayed the growth, in order to enlarge the boundaries and resources of agriculture by an extended variety of practices and productions, which the more they come under scientific investigation, the more they exemplify the uniformity of those natural laws whose multiplied phenomena they exhibit. Nor have the minor distinctions of SOIL a less useful influence. The amelioration of clay soils by drainage and subpulveration is but, on examination, an approach, by means of art, to the natural advantages presented in the percolating powers and free texture of the lighter soils; while the latter, by the compacting tread of animals in the out-door consumption of root crops, since the introduction of the turnip husbandry, have by an earlier improvement, though still of recent date, been raised from comparative sterility to the degree of adhesiveness requisite for the wheat crop, to which they were naturally unadapted.

And if differences of ALTITUDE, a point still but little considered by the farmer, may seem, perhaps, less amenable to the resources of art, they yet afford, within the narrow limits of a single country, or even province, those varied periods of *maturity* which tend to modify the inconveniences which attend a seedtime and harvest too closely contemporaneous upon every district.

Nor has the remoteness of the farming life from the busier marts of activity and intelligence proved a permanent barrier to the advancement of agriculture. If Arthur Young's advice, that he should appropriate to travelling, that short respite from his labours which usually occurs between the hay and the corn harvests, have been as yet but partially adopted, and least perhaps by those who most require it, yet the increase of agricultural meetings brings him into frequent contact with growing sources of information and general advancement. Many a scientific truth, at first ill received or even derided, is, nevertheless, carried away clinging unconsciously to the mind, like the seed-down of certain self-disseminating plants, and forms the germ in a new district of some useful experiment that may either prove it, or prove something else equally valuable. Indeed the increase of local and national societies has, of late, opened up a wide field for mutual improvement, comparison, and instruction; and though the mere rivalry of stock exhibitions, resulting from the premium system, has to a great extent overlaid the more important subject of *cultivation*, there is growing evidence that this is giving way to a system calculated to promote more directly those branches of agricultural science, which are the more backward only because they are less susceptible of ocular proof. A well-drained and deeply cultivated field not being a subject of portable demonstration, obliges the admission of that secondary evidence furnished by the *written record of the experiment*; and, while it brings into existence a kind of agricultural literature very different from that which is to be found in the essays of mere theorists and compilers, encourages that practical investigation and thoughtful discussion of principles which render each man's individual experience and report an involuntary contribution to the common stock of knowledge. Under the influence of this cause, the spread of such periodicals as the monthly or weekly journal, has brought to each man's door and fireside, a whole neighbourhood and fraternity of experimentalists and reasoners engaged in the same pursuit, and bent upon the same objects as himself, liable, no doubt, as all are liable, to error, exaggeration, or prejudice, but containing, that best of antidotes which is to be found in the antagonism upon the same page of conflicting errors, opposite opinions, and the prejudices of isolated localities, exposed to fair comparison and correction.

Hence, the slow response of nature to the questionings of an individual mind, the small and protracted experiments for which a single life is barely sufficient, in an art opening up such infinite variety of circumstance and condition, are multiplied a thousand-fold by the involuntary action of a host of contemporary searchers connected by the tie of mutual interest in each other's discoveries. The aid of the press, and the increasing facilities for the transmission of its productions, witnessed in our own day, bid fair to dissipate gradually the mist which seems spread over the whole earlier history of agriculture, when the efforts of each toiler were shrouded from the view of others, by the isolation of his own acres, and the difficulty of combination to a common end. The early struggles of the human race, which have printed the bloody stamp of the sword upon the continuous page of history, have found a respite in the discoveries of science, and advancement of social intercourse, which may, perhaps, be gradually tending to a state of comparative peace, founded upon a wider basis than any which the earlier condition of mankind has appeared to present. Should this be indeed presumable, a conclusion cannot fail to suggest itself out of the primeval and long antagonism of the sword and the ploughshare, which must place the whole subject of agriculture before us in a new point of interest, through its imperative relation with the increasing numbers of mankind.

The steady advance of population in this and the other temperate regions of the earth, exhibiting in the case of our own country (after taking the balance of births and deaths) a surplus daily of nearly a thousand fresh mouths demanding sustenance; the rapid increase of towns, of roads, railroads, and of buildings, all requiring their portion from the surface of the land, have begun to present the somewhat important problem of an increasing occupation of a limited area of space.

Yet to the improved resources of art we are already indebted for an augmentation of the produce of the soil, in a near proportion to the growing demand, and that not only by the aid of newly-found manures, and a consequent increase of acreable yield, but what is especially observable, by that other and less exhaustible fertilising influence, the inventive faculty of the human mind, investigating, adapting, arranging, and economising in a thousand ways the means and appliances of matter. And when it is borne in mind that the productions of the earth are the basis of all trade, the source of all wealth, and, through the interchange of commerce, the leading cause of the social intercourse of nations, the study of improved cultivation destined, perhaps, to be coeval with the continued existence of the human race, can be held in no light regard by any mind that has arrived at the perception how intimately blended and inseparable are the links by which our material wants are connected with the whole framework of our social and moral existence.

For if the physical sciences, as we call them—if those familiar names of Geology, Chemistry, Botany, Physiology, and the whole string of kindred studies, each in a greater or less degree connected with the labours and research of the agriculturist, be indeed but the multiplied titles which we have given to the various but correlative parts of one great machine—if their separate investigation be after all found concentric to the same end and object—the knowledge of His works and mode of action, who has made nothing in vain, nothing deficient, nothing superfluous, may they not begin to assume to our understanding something beyond what we are accustomed by habit to associate with the name of 'physical'? Have they no ultimate purpose or bearing, no mission to mankind beyond the analysis of a soil, the cultivation of a plant, or the filling of a granary or a museum, as 'the be-all and the end-all' of human knowledge?

We look around and find ourselves amidst a great and harmonious system whose laws are ever pressing around us: more and more clearly the knowledge breaks upon us, that we are a constituted part of that system, in which the humblest even of the material parts have each their appointed purpose and connection with the rest, and, as the subjects of human labour and intelligence, become pregnant with results which carry on, far beyond our own ephemeral plans and purposes. It is at this point of view that the material and the moral world begin to blend together to our mind and reasoning. Causes and effects which we once regarded as purely physical and temporary, begin to assume a wider aspect, a permanence and moral fixity of purpose, which, when regarded by themselves, we had never attached to them. The sustenance, the comforts, the conveniences of life achieved by art and science, are no longer the mere utilitarian objects of human ingenuity, nor the matter from which they are struck out, nor the minds that struck them out, things to contemplate independently or for their own sake alone. Physical things, and the sciences which relate to them, begin to be invested with a garment of meaning and of purpose altogether new. The drained morass, the fresh-turned fallow, the waving corn-field, the meadow, with its herbage interspersed by flowers, no longer stand separately before us as things of mere labour, utility, or beauty, or our relation with them the accident of a day. 'Day unto day uttereth speech, and night unto night giveth knowledge;' but that speech and knowledge are not the mere 'profane history' of nature. A higher ordinance and appointment, enveloped within their teaching, become gradually but irresistibly revealed, binding and disposing all to work together to the greatest ends, not of the individual only, but of the whole family of man; not of his physical necessities or intellectual pursuits alone, but of his whole relation with that Highest Wisdom, whose evidences and attributes are engraven upon the fabric of nature, in characters not of power or knowledge only, but of universal and inexhaustible beneficence.

It is to that unacquaintance with the true character and relations of the material creation, commonly witnessed as the result of an imperfect cultivation of our perceptive faculties, that we can alone trace the almost contemptuous indifference under which the wholesome intercourse with nature, presented by agricultural pursuits, has been committed to the rudest and most illiterate of the human community, and the study of subjects consequently neglected, whose submission to our daily wants and attention affords the best evidence of some higher and inherent claim to our regard. To follow their daily occupation, blind to its chiefest privileges, or merely intent upon its more perishable objects, has been hitherto the misfortune of many, the fault perhaps of some, amongst that class whom the poet of Mantua has memorably designated as 'only too happy, did they know their own blessings.' Forgetting, or never having considered, that He who made the mind of man can address it without the aid of language, that the whole creation is His book of symbols, adapted to strike its images direct upon the mind, as on a mirror, and replete with analogies that penetrate to that inward vision, which we aptly term *Re-flection,* we are wont to disrobe the earth of every solemnity of character or purpose beyond its mere adaptation to our daily requirements, or to an occasional poetical similitude or pictorial effect. Yet, while we acknowledge and enjoy its material uses, neither can nor ought we to be blind to its moral aspect, as the foundation of that analytical course of inductive truth, which, rising from the earth, like the ladder in the vision of the patriarch, mounts step by step towards that highest knowledge attainable by man, the attributes of his Creator depicted in the works of His hand. Ample indications are not wanting, even in the dawn of physical research with which our own generation is contemporary, that in this view of his pursuit, as the noonday of maturer science advances, the agriculturist may recognise his highest privilege and pleasure; and like the bodily health and repose which come from daily industry, may draw from the intercourse with nature to which his avocation leads him, springs of happiness that outlive the toil they have solaced, following their course in the harmony of natural with revealed truth, and the love and worship that both alike claim, from the finite to the Infinite.

‘LANDLORD.’

REMOTE in its origin, and constituting, in the early stages of society, almost the only form of wealth and power, property in Land has in every civilised country passed through a long course of historical incidents and changes before it becomes a subject of critical investigation to the agricultural enquirer or the economist. A right like that of ownership in the soil, which no one ever questions so long as there is ample space unoccupied, comes naturally, however, under closer scrutiny when increasing population has begun to reduce the acreable ratio of the land to its inhabitants. Thus the history of many countries has recorded the fact of strenuous protests against the very right itself of exclusive territorial possession, generally about that period when it had, in fact, become most fully established; when occupation of such lands as were worth occupying had become nearly complete, and when the inviolate nature of the right had begun to extend itself to other kinds of property, and to tinge the character of society by the necessity of more serious and settled forms of industry, as the free gifts of nature were no longer sufficient or available.

Yet this question has been from time to time re-argued, because prominent as must ever be the assertion of the law of *meum* and *tuum* in the case of land, to every denizen of 'the earth' which was 'made for all,' it opens up one of the deepest problems of social economy, and refers back to the very first principles of 'right,' deep lying in the natural and intrinsic claim of labour to its reward. But the enquiry is itself a distinct and wide topic of research, requiring only to be referred to, as showing that every human right, however absolute and accredited, has its corresponding debtor-page of duty and obligation; and that to deny the abstract right of property in land, on the one hand, and on the other to assert its irresponsibility to society, are opposite errors, in the interspace of which lies the true field, and unquestionably a very important field, of practical enquiry.

In no country, it may be fairly asserted, has the subject had a more growing and instructive development than in our own. The word *landlord*, traced through all its phases, from our earliest annals to the present time, would itself almost furnish a history. Language, changeable as it is, often outlives far greater changes in the social state; of which this word is a standing instance, remaining like an ancient and time-worn landmark, indicative of the almost sovereign power once attached to ownership in the soil. From the earliest recorded times of our Saxon ancestors, those true lovers of the field who 'dwelt not in cities, and would scarcely tolerate house joined to house, but lived apart, each by himself, as the woodside, the plain, or the fresh spring attracted him,'* the possession of land has been almost a national passion. To them it was an essential of nobility, of respect, and even of personal freedom; to be without it was to be almost without civil rights; it was the heart and centre of their social system. 'There is no trace of such a qualification as constituted *citizenship* at Athens or Rome. Among our Saxon forefathers the idea of the city had indeed no sway. They formed voluntary associations upon the land for mutual benefit. In fact their settlements, whether isolated or collective, were based throughout upon the idea of property in land; it was not the city but the country that regulated their mode of life and social institutions.'*

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* Tacitus, de Moribus Germanorum.

A glance at the early history of nations is sufficient to show the diversity of character that has existed amongst the different tribes of the human family in this particular—their relation to the soil, and its important influence in the development of the social state. The distinctions recognised by ethnologists in the colour of the skin, and the form of the skull, have not been more marked, scarcely more varied, or transmitted more faithfully and indelibly.

The independent and systematised habits in relation to land, pre-eminently marking the Germanic race of Europe, which so early drew the attention of Tacitus, have been referred to by one of the most philosophic of modern historians, as having probably contained the germ of the greatest revolution the world has ever seen—the overthrow of the Roman empire and the whole framework of ancient civilisation, by the pressure of a population that, nurtured through unrecorded centuries, was at last driven forth to enterprise and conquest by the home operation of a principle little understood by the elder kingdoms of the world, and which the supercilious and unsuspecting ignorance of Rome cared little to enquire into; a principle identical with that which has colonised this country by successive kindred races, and has spread its effects in later periods to America and Australasia. Venting itself anciently in the form of conquest, and in modern times under the milder name of colonisation, it was yet, like the *swarming of the hive*, the offspring of home instincts and of habits naturally opposed to the true wandering character, yet irresistibly determining each individual to seek a separate and fixed settlement, whereever land was abundant and population thin and scattered. However rude its manifestation in early times, it is the nature of this principle to show itself as the social state advances, not more in tenacity of the right of property than in the inviolate respect for that of others—phases of the same character, commonly reaching its highest development in those climates and soils where nature demands most at the hand of man, and yields nothing except to labour, the source of all property and of all individual and national advancement.

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* Kemble's *Saxons in England*, c. 4.

The introduction of what were called the feudal tenures, at the time of that event in our history called the Conquest (*Conquæstio*), found the system of landed property amongst our Saxon ancestors so established and defined, and therefore congenial to its adaptation, that it can scarcely be said to have done more than clench into the framework of a closer vassal tie with the sovereign, the work of which Alfred and his successors had prepared the details. The change of ownership caused by this event was by no means so great as the ordinary use of the word 'Conquest' has made it common to suppose. William the Norman claimed succession to the sovereignty of England under the will of Edward the Confessor, a title carrying with it in that day considerable weight, and was crowned with the acclamation not only of his Norman but of his English subjects, whose laws he promised to observe. Though many confiscations were made to reward his more distinguished followers, the extensive fiefs thus granted, embracing vast districts but partially enclosed or cultivated, left the actual usufruct of the soil little changed, though subject to new burthens and incidents of vassalage to the new territorial lords. 'Inferior freeholders were probably much less disturbed in their estates than the higher class. Though few of English birth continued to enjoy entire manors, it is reasonable to suppose that the greater part of those who appear under various denominations to have possessed small freeholds and parcels of manors were no other than the original natives.'*

To trace the history, or dwell upon the character of feudal ownership, with its well known and often described incidents of tenure through periods and stages of society long passed away, and which, if not really deserving the name of barbarous, are at least disconnected from our own time by features amounting to positive contrast, would afford little of useful information. The richer the subject they have afforded for romance, the more remote they confessedly become from actual life, and the greater the implied change of circumstance that has intervened. Protection and able leadership in war, or in the more quarrelsome leisure of peace, on the one side, with a long list of duties and services, perhaps as readily yielded as any other kind of rent, on the other, were the main terms of the rude contract of lord and vassal, written in the necessities and stamped by the habits of the time. The feudal relation which connected them together, well suited to the wants of the period in which it grew up, only became burthensome or ridiculous as it outlasted them. A relation so close and stringent, running through the gradations of society like a dilating network, connecting ranks by the ties of mutual interest and alternate subordination, rather claims our surprise and even admiration for the completeness of its establishment and the extent of its sway over Europe, during a period of frequent war without, and of internal rapine within each state, than induces serious comparison with the individualised freedom and resource, slowly achieved for modern society out of the ruins of that system, by the general advancement of wealth, knowledge, and all which is included under the term civilisation.

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* Hallam, *Middle Ages*, vol. ii. p. 425.

'There is something naturally attractive,' says Mr. Mill,* 'in a form of society abounding in strong personal attachments and disinterested self-devotion. Of such feelings it must be admitted that the relation of protector and protected has hitherto been the richest source. The strongest attachments of human beings in general, are towards the things or the persons that stand between them and some dreaded evil. Hence, in an age of lawless violence, and insecurity, and general hardness and roughness of manners, in which life is beset with dangers and sufferings at every step, to those who have neither a commanding position of their own, nor a claim on the protection of some one who has, a generous giving of protection, and as grateful receiving of it, are the strongest ties which connect human beings; the feelings arising from that relation are their warmest feelings; all the enthusiasm and tenderness of the most sensitive natures gather round it; loyalty on the one part, and chivalry on the other, are principles exalted into passions. I do not desire to depreciate these sentiments. But the error lies in not perceiving that like the clanships and the hospitality of the wandering Arab, they belong emphatically to a rude and imperfect state of the social union, and that the feelings between protector and protected can no longer have this beautiful and endearing character where there are no longer any serious dangers from which to protect. The arrangements of society are now such that no man or woman, who either professes or is able to earn a livelihood, requires any other protection than that of the law. This being the case, it argues great ignorance of human nature to continue taking for granted that relations founded on protection must always subsist, and not to see that the assumption of the part of protector, and of the power which belongs to it, without any of the necessities which justify it, must engender feelings the opposite to loyalty.'

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* *Political Economy*, vol. ii. chap. 7: 'On the probable Future of the Labouring Classes'—a chapter worthy of attentive perusal.

Nothing is more descriptive of the change brought about in the relation of landlord and tenant, than the simple but significant history of Rent. Absolutely *personal* in its nature at first, and demanding the actual presence of the tenant for the performance of bodily services, from the following to the field of battle or the chase, to the holding of a stirrup or presentation of a cup; we find it in its second phase commuted into returns of produce—rent in kind, as it is called—in place of personal duties; and third, and lastly, in the present form of money-payment, formerly the rarest and most occasional of any. Even lands let upon lease were almost universally for rents payable in kind, which included nearly every article of common consumption, not confined to agricultural produce alone: handicraft trades of every kind were practised either upon the farm or in the houses of the great, the proceeds of which were the stipulated return for the use of the land held by the tenant.* For the general purposes of life, coined money was of infrequent use, in times when commerce could scarcely be said to exist, and when the difficulties of communication in the country allowed of little trade beyond the occasional interchange with the nearest town or village, of farm-produce for some of the finer articles of clothing: 'Even the baronial hall was only lighted through wooden lattices; or, where unusual grandeur or delicacy were affected, through windows closed with horn or parchment: the naked walls of the apartments were only occasionally hung with loose tapestry, to conceal the rudeness of the masonry; the floors were strewed with rushes instead of carpets; the beds were partly, if not wholly, composed of straw; and the lord of an extensive domain indulged in fewer luxuries than a modern farmer. The stimulus of trade was wanting, and with it all incentive to labour for a surplus beyond the wants of mere sustenance. Living in the midst of his retainers, the feudal lord was supplied either from the produce of the land surrounding his dwelling, or by the contributions of his more remote tenants: his expenses consisted principally in the exercise of a rude hospitality; and the few foreign luxuries which the habits of men then rendered necessary to enjoyment, were obtained for the wool and hides of his flocks and herds, in which, from the great extent of its pasturage, the kingdom abounded.'*

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* Muratori, *Antiq. Dissert.* 11.

The growth of towns and the gradual trading acquisition of capital amongst their increasing and industrious inhabitants, and the activity of the wealthy burghers in obtaining grants of corporation, and guilds, with various municipal privileges attached to them, from successive monarchs or neighbouring barons, in return for loans, for market-tolls, and other exactions, slowly in the course of centuries undermined the power of the feudal system in Europe. But this country presents in the early history of its Parliament a peculiar and countervailing feature, the effect of which was to sow, in the fresh soil of decaying feudalism, the seeds of a future growth and extension of power to the land-owning class, which soon rose into a more than rival stature with the advancing influence of commercial wealth. The great majority of the smaller boroughs sending members to Parliament, had been from the earliest time under the command of the neighbouring peers and gentlemen;[*] and, even where this was not the case, the labours of the Senate soon showed a tendency to fall into the hands of those who had leisure for the discharge of public duties, and whose employments and habits of life were least interfered with by the absence from home which those duties occasioned. This cause, together with a certain prestige of independence and patriotism, always, in some sort, attaching to the owners of the soil, eventually led to an open recognition of landed property as an essential qualification for a member of the Legislature, and produced the statute[†] which at length gave the force of law to that which had been long a growing practice; changing materially the original idea and constitution of the House of 'Commons.' And thus the very cause which had been, at first, instrumental in subverting the ascendency of a comparatively small number of great territorial owners—aided by a gradual absorption of the once numerous and characteristic class of small freeholders and yeomen—eventuated in the transfer of a far more extensive power into the hands of a class of landowners, once, indeed, a 'middle class,' but which the increasing value of land raised, by degrees, to a position of wealth and political importance, that recovered, in parliamentary power, an ample equivalent for what had been lost in the decay of feudalism. The history of the seventeenth and eighteenth centuries strongly exhibits this advance of the landowning body to a preponderance in the legislation of the country, the traces of which have survived to our own day, in the 'influence' which the possession of land, compared with other kinds of property, is commonly regarded as conferring.

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* Introduction to *British Husbandry*, U.K.S. p. 17.

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[*] Hallam, *Constitutional Hist. of England*, vol. iii. p. 402.

[†] Act 9 Anne, c. 5.

But, concurrently with the course of events above described, another cause has existed in this country, the latent agency of which upon the history of landed property, and as especially affecting our whole agricultural system, can hardly be over-estimated. The feudal system, however decayed and antiquated in its outworks, by the lapse of time and events, as a national and social organisation, retained, in our body of real-property law, a fortress that has, with singular tenacity, preserved most of the features of its original structure amidst surrounding change. The descent of landed property according to the order of primogeniture, the leading feature, or rather the very backbone of feudalism, has survived the great system which gave it birth and associated it with men's notions of natural right, as connected with the inheritance of land. Whether from the fact that law-books outlive revolutions, and, like old habits, retain their current action upon society, by a *vis inertiæ* that outlasts the alternations of public opinion, or whether that this incident of feudalism possessed accidentally features consonant with the developing character of the nation, or perhaps from a combination of both causes, the rule which devolved the inheritance of a landed estate exclusively upon the eldest son (regarding it not in the modern light of a certain amount of property appreciable at a money value, but as an inalienable entirety held under the crown on the condition of military service, and furnishing a fixed quota of armed followers bearing the same relation to their landlord as he did to the sovereign), this rule has been not only retained by the forms and principles of our law, and incorporated in its language, but so far countersigned by the modern custom of family settlement and entail, that it has acquired a presciptive homage and habit which render an unbiassed critical consideration of its phenomena and consequences exceedingly difficult.

So long as land, under its feudal relations, was regarded as a thing out of commerce altogether, no great inconvenience or complexity resulted from any arbitrary laws that might be made to regulate its succession; but when, in the progress of things, it becomes a subject of ordinary bargain and sale, of conversion into money and re-conversion, the striking incoherence of two principles of succession to property, one of which recognises no difference of sex or order of birth, like our law of distribution of the personal property of intestates, while the other devolves the whole inheritance npon the first-born male, to the exclusion of the other children, is productive of an intricacy of legal distinction and an uncertainty of judicial decision,* which it is difficult to justify, even on the narrow grounds on which the subject is commonly discussed; and renders the mass of litigation between heirs-at-law and personal representatives that crowd our Chancery Courts, an evil of scandalous extent in our own eyes and those of other nations. 'No human laws,' says Blackstone, 'are of any validity if contrary to the law of nature; and such of them as are valid derive all their force and all their authority, mediately or immediately, from this original.' But, next to a system of law based upon no natural or moral principle, the most objectionable is that which attempts to embody into one code two principles essentially incompatible, confusing the popular sense of right, and in an equal degree suggesting fear to the conscientious, and encouragement to the mere adventuring claimant.

But, whatever its intrinsic merits or demerits in a social point of view, the law and the resulting *custom* of primogeniture exercise a wide-spread effect even upon our agricultural system. Wills and family settlements have a natural and almost necessary tendency to follow the example which the law prescribes in regard to landed estates; and when to these causes are superadded the technical difficulties, delays, and expenses attending the transfer of land even in large, but still more oppressively in small quantities, the effect produced upon its marketable character transfuses itself through all the channels of individual motive and interest which underlie and govern the whole economy of cultivation. The soil of the country gradually concentrated under these stagnating influences, into the hands of involuntary, often of mere nominal owners, finds vent in an immensely extended system of vicarial occupation by farming 'tenants,' as a self-grown substitute for the denied ability of sale and purchase. Experience has shown, on the one hand, that the owner of a large tract of land, even if he have the requisite capital or knowledge, cannot successfully become the great farming merchant of his own acres, or employ them in any way so advantageously as by letting them, in subdivided portions, to others; on the other hand, an immense floating capital, debarred by the causes above mentioned from investment in the actual purchase of land, is found ready to employ itself in an occupation which, if not uniformly profitable or secure, is, of all others, the most natural and agreeable—that of agriculture—and which may be, or, at least, in practice is, pursued with little preparatory outlay of education or apprenticeship, and therefore under great competition. Hence we have in this country, in the place of that middle proprietary class of yeomen, which has gradually disappeared, a system the most entensive in the world (Russia excepted), of large estates held under strict settlement by a succession of life-owners, let in large farms to tenants, whose capital is exclusively employed in a temporary investment in the soil, which, in the great majority of cases, does not amount to a leasehold tenure. The system is so familiar that it does not strike us as artificial or conventional, yet it undoubtedly is so; and the relation which it creates between the parties, and the rights and duties arising out of it, on both sides, must necessarily follow the nature of the system which gives rise to them.

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* See case of Ackroyd and Smithson. 1. Bro. c. c. 502.

Yet it cannot be denied that in no country has farming, looked at in a mercantile point of view, as a business, been developed on a grander scale than in England and Scotland, concurrently with this system. The capital which would purchase a very inconsiderable acreage, enables a farmer of skill and experience to put forth powers of production on a scale of much greater extent in the tenancy of another's property, and, as compared with the cultivation of land on a small scale, with a supposed better economy. Such seems to have been the impression derived from a comparison of our own specimens of large and small farming; and most people carry on the conclusion as presumptively applicable to land held in *property*, as well as in *tenancy*. But the large capitals commonly employed in the mere tenant-occupation of another's land, however satisfactory as an evidence of wealth and enterprise, and productive of a broad and liberal system of farming, are a doubtful compensation, in the first place, for the absorption that has taken place of every vestige of a real middle class of landowners; and still less does it atone for the want of freedom of exchange in land, or for that ready investment of capital, and employment of labour, which absolute ownership invariably promotes. In France, where land is arbitrarily divided by law amongst the children of the owner, allowing but a small portion to be devised by will, we have an instance of state interference the converse in principle to our own system, but even more obtrusive and tyrannical in effect; inasmuch as, in England, the law is supplementary only, applying in cases of intestacy or disputed inheritance, but leaving free the power of will or settlement, except so far as these are affected by its example. But it is strange that in neither country does any approach seem to be made towards the wholesome middle course of leaving land, like every other kind of property, to its own natural law of accumulation and partition (to both of which it is affected, like every other form of capital), by dealing with it, in cases of intestacy or disputed title, precisely upon the same equitable principles of division that are applied to personal estate.

The artificial subtleties and distinctions between 'real' and 'personal' property resting upon no true basis, and the mass of litigation given rise to by the recognition of two conflicting principles of inheritance in descriptions of property reciprocally convertible under the hammer of the auctioneer, produce an amount of evil wholly unjustified by the assumption commonly urged as a vindication of our law of landed succession, that without it the soil would have a tendency to extreme subdivision. There is not a particle of evidence producible in support of this widely-spread assumption. The cases of France and Belgium, and the Rhenish provinces, often brought forward to illustrate it, are proofs on the contrary side; for, great as the subdivision of land is in those countries compared with our own, an inherent tendency has long ago begun to develope itself, more and more *antagonistic* to the avowed object of the French law of *compulsory* partition. It is difficult to account for the prevalence in England of views on this subject, so confused by hasty prejudice, as to rush into an alarming comparison (as even such a writer as Mr. M'Culloch has done), between our *law* of primogeniture which applies only in cases of intestacy, and the system of our continental neighbours which with true despotic liberty takes from every man the power of making his own will, arbitrarily subdividing his land according to the number of his children. The choice is not between the one extreme of a law which so conveys a property as, 'in order to enrich one, beggars all the rest of the children' (as Adam Smith describes that of primogeniture), and another extreme, which arbitrarily cuts up every estate according to the number of the children, with or without the parent's consent. Admitting that the latter is the more objectionable of the two extremes, the true principle may lie between them,—namely, in a law which assuming the intention on the part of the parent of fair and equal division amongst the children, applies *in cases of intestacy* the same principle in real as in personal property, where it does so assume already, and with an universal satisfaction unchallenged even by the staunchest advocate of primogeniture in land.

The question is, however, likely to pass soon out of the sphere of abstract discussion. 'No improvements,' observes Mr. Mill,[*] 'operate more directly upon the productiveness of labour than those in the tenure of farms, and in the laws relating to landed property. The breaking up of entails, the cheapening of the transfer of property, and whatever else promotes the natural tendency of land, in a system of freedom, to pass out of hands which can make little of it into those which can make more; the substitution of long leases for tenancy at will; above all, the acquisition of a fixed interest in the soil by the cultivation of it; all these things are as real, and some of them as great improvements in production as the invention of the spinning-jenny or the steam engine.'

From its own inherent nature, insufficiently studied or understood, though very extensively felt, there is no subject of human labour possessed of powers and laws more resilient and lifelike than the soil: it is not more truly the exponent of the character of its cultivator than a tell-tale, in the long run, of the laws under which the cultivator himself is placed, and by which he is influenced. It cannot be made the subject of erroneous or impolitic legislation in the hands of the proprietor, any more than of bad husbandry in those of the tenant, without developing consequences which reach, unhappily, beyond these classes, to the detriment of all connected with or employed upon it, though innocent (as in the case of the labourer), and even ignorant of the originating cause of the mischief. Its ownership, as well as its occupation (if these are divided) brings with it a trust, the performance of which is enforced by penalties, often indirect, but as sure and inexorable in result as any other law of nature. Even if its specific capabilities were not augmented, as they continually are, by the advance of agricultural knowledge and practice, rendering each acre the medium of an increased production, yet its relation, regarded merely as a limited space against unlimited occupiers, undergoes perpetual change. The responsibility with which its ownership is thus pregnant becomes more and more pressing and compulsory; nor is it, fortunately, one difficult of performance, provided only that the circumstances of ownership itself, the conditions essential to the due execution of its duties, proceed in the same ratio, keeping up with the demands of the time. But it is here that we sometimes see the rights of one age become the wrongs of another. Modes of settlement carving out the proprietary interest in land into a series of limited 'estates' for life and in tail, each in succession barren of power or motive to the existing owner to deal with the land, even for its own improvement, present a very different aspect during periods such as that which elapsed from about the close of the last century to the termination of the war in 1815, throughout which the value of farm produce and the rent of land was rapidly advancing,—compared with the period of corresponding decline of prices which has ever since existed: and it is doubtful how far it would have been possible to maintain the system in its full force, but for the extraordinary advance of population, trade, capital, and farming skill which have proceeded inversely with this decline. But the increased energy and activity thrown upon the tenant to keep up with the demands of the time, oblige him of necessity to look to the proprietor for an aiding hand, towards the necessary permanent improvements required, before his own capital as an occupier can be beneficially invested; and also for such a security for his investment, as is justly due by the laws of commerce thus awakened into operation upon the land, and brought into conflict with the usages of entail in a manner never before experienced.

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[*] *Political Economy*, b. 1. chap. xii.: 'On the Law of Increase of Production from Land.'

The new relation thus given rise to between the two important classes of owner and occupier, and the obligations thrown upon the former to assume the position of a capitalist in the first instance, and secondly, to provide in the land the required security to the tenant, either by way of lease, or of compensation, have, of late years, formed a prominent topic of discussion. Ample demonstration has not been wanting of the benefits that would arise from the closer attention of the land-owning body to the business of their estates, and the claims which an advancing system of culture makes at their hands. It has not been difficult to point out the necessary improvements to property that might be undertaken with advantage by any one ordinarily alive to his own interest, and free to act up to his knowledge. Enclosure, drainage, irrigation, the erection of more suitable farm-buildings, repairs, roads, leases, and tenant-right covenants, all the improvements of which land is susceptible, have been ably enforced, with a clearness and self-evidence scarcely complimentary to the subjects of advice so obvious, and duties so attractive. But there is a preliminary question neither so popularly understood nor ready of solution, which is overlooked. It is one that secretly governs and interpenetrates the whole subject.

It is believed that two-thirds, at least, of the land of this country are in strict settlement: the 'estate' enjoyed by a present owner is, in the great majority of cases, a matter of strictly defined legal limitation. But, besides the mere shackles of entails, the land is subject to an immense variety of incumbrances totally distinct from its direction of inheritance. It is probable that not more than half the income derived from land truly belongs to its nominal owners. The remainder belongs beneficially to others—to mortgagees, rent-charge owners, jointresses, annuitants, and the like, while the nominal owners bear all the costs of management, and all the accidental or occasional losses which are necessarily incident to land. The present proprietor may be the father of a large family, all unprovided for except the eldest upon whom the entail devolves;

and every outlay on the improvement of the property by the parent is only so much added to the inheritance of the eldest, to the loss of the unportioned part of his family. Or, he may be the mere tenant for life in tail, with or without issue, of a property passing away into remote hands at his death; or, he may be a young proprietor, just come into possession of a property burthened with jointures, mortgages, and the unpaid portions of younger brothers and sisters charged upon the estate. Such cases, and others of a similar nature, form the large majority; absolute and independent ownership is the rarest of all. The difficulty of improvement lies generally far less in the unwillingness or ignorance of the landowner, than in the irrevelance of the proposed advantage to his personal interests in his parental or other capacity; or in his pecuniary inability to undertake it.

These impediments have been partially met, as far as enclosure and drainage are concerned, by the Drainage Act,* enabling owners of land to execute these improvements under the assistance of Government loans; and by a more recent Act,† to lay out private capital, whether that of others or their own, upon the settled estates, in such a manner as to constitute a separate investment devolving as rent-charge in favour of the lender upon the heir at law, or next in the settlement: it remains to be seen whether these measures, however momentarily advantageous, will prove satisfactory. A merchant or tradesman who borrows capital to carry on a business too large for his actual means, is not, as a general rule, considered to be acting prudently. The safer rule, founded upon wide and general experience, is to adapt the business to the capital. It is obvious that, under the ordinary course of circumstances, the owner of an estate larger in extent than he was able to improve to its utmost—like the occupier of a farm too large for his capital—would be advised rather to part with a portion of it than to enter into deeper obligation and wider engagements with an acreage already overgrown, by making fresh investments upon it of borrowed money, which, besides the payment of interest, will soon be found to involve a further extension of those liabilities which all who have any experience of the charges upon landed property know to be self-generating. If the system of tying up in settlement land of which the annual rent actually belongs not to the nominal owner, be itself vicious, palliations which attempt to meet the case by loans seem fraught with the danger of encouraging a course of investment which will presently necessitate further artificial aid to support it; and of strengthening and indirectly subsidising the system of family entail, as against purchasers, thus preventing the application of *free capital* to the soil which it should be the object of both law and policy to facilitate.

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* Act 9 & 10 Vict. c. 101.

† Act 12 & 13 Vict. c. 100.

In the case of the Act last alluded to, called the 'Private Money Drainage Bill' (Act 12 & 13 Vict. c. 100, s. 2 and 9), so far as it applies to the security for investments of their own capital, made by the owners of settled estates for the benefit of younger children, or for any other purpose separate from the inheritance, the measure is neither more nor less than a recognition of the principle of 'tenant right' in favour of *Tenants for Life*: a principle unexceptionable so far as it sets free the employment of capital in land for the purposes limited by the Act; but objectionable, in that it transmits to the succeeding generation a fresh burden of mere ostensible ownership, constituting the next heir to whom the estate devolves, the mere rent-payer for his predecessor's improvements, the benefit of which will belong to others.

That mischief should still be found to cling in practice to an enabling power so fair and just in itself as that offered by this statute, is a circumstance which seems to point towards some radical evil in the present system of settlement of land. It is, however, sufficiently clear that every legislative advance towards the security of investments made upon land, whether to the life-owner or to the agricultural tenant, must operate by cutting off the claim of the remainder-man in one case, and the landlord in the other, to the land with all the investments made by others upon it; a claim which exactly in proportion as it confiscates the capital so employed, checks investment by the tenant, and reduces the agricultural labour-market to its lowest standard.

The position of the landlord who is tenant for life, and of the farmer who is tenant-at-will, is nearly analogous. In both cases the outlay of private capital is discouraged: in both cases the want of capital proportioned to the acreage should as a rule be met, not by the artificial aid of loans, but by the natural policy of a reduction of the acreage to the means of improvement. The history of real property exhibits a chain of statutes constantly directed t viate the monkish ingenuity of mortmain, which found its substitute in modern times in the vain d of family pride to tie up the nominal ownership unborn inheritors, regardless of the mischief prod by a self-renewing chain of feeble life-estates, in co tinuous postponement of the living to the unb generation, each inheritor in succession, on coming age, exchanging his remainder in fee for an emas lated 'life-interest,' the effect of which is seen b comparing the spirited outlay and improvem carried out on estates held in fee or newly purchased, with those which have been tied to the hands of successive owners, burthened with a lengthened chain of incumbrances.

The common mode is for the present possessor to have an estate for life, with remainder in fee to his son, who, on coming of age, usually joins with the parent in breaking the old entail; and a resettlement is then made similar to the previous one, by which he and his successors, whether living or unborn, are placed in their turn in the same position as that before occupied by the parent, whose debts, if any, are commonly, on this occasion, charged upon the estate by mortgage, and the interest upon these, together with the jointure of his widow and the sums charged on the property for younger children's fortunes, or the interest due upon them, become fixed payments from the gross rental, when the property devolves upon the son; add to this the annual outlay for repairs, an item in itself commonly estimated at from five to ten per cent. upon the gross rental. It is difficult to conceive a position more calculated to check the means and disposition for land improvement. Brought up in the expectation of wealth, with no profession except that which his estate affords, we will suppose the owner devoting himself to the utmost of his means to advance the value of his property. He finds very soon that the improvement of land is neither more nor less than an investment of capital, as well as of time. A family of 'younger children' are meantime growing up, and a very little forethought reminds him that not only the whole bulk of the estate, but all its improvements with the money invested in them, are destined to become the property of the eldest son alone, to the exclusion of the other children. The natural operation of the parental mind is to cut off every possible expense upon the estate, with the view of securing a fund for the children who are unprovided for. But there exists also another element of expense, pressing especially upon the owners of land, and practically operating in restraint of its improvement, which has grown out of the system of entails, namely, the wide-spread and constant dependence on the part of the owner of this kind of property upon legal advice. He cannot buy, sell, borrow, nor even let, nor, in fact, deal in any manner whatsoever with the acres which should supply the occupation of his life, without the advice of a lawyer. The expenses thus incurred commonly form no small portion of the charges upon a landed estate, as inevitable as its repairs. So deep-rooted and old established is this necessity, that by the great majority it is regarded as unavoidable, inherent in the very nature of landed property. The practical agency of estates was for this reason, until very recently, almost entirely in the hands of lawyers. The *land-agent*, apart from the lawyer, is a comparatively modern profession—the result of a growth in agricultural science, and of new practices and requirements, to which the lawyer is from the nature of his education and pursuits a comparative stranger.*

Whether this perpetually self-renewing system of leading-strings, applied with such tenacity to *landed* property, and restraining at once its freedom of agricultural development, and of commercial interchange, affords any adequate compensation in the way of moral benefit to the individuals themselves who are its objects, or to the other members of society, is

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* It is a point commonly assumed that as rents rise with any

considerable or permanent advance in the value of farming produce, they must also fall, conversely, in the same degree. According to the rules of economic science, this is not the case. Land being a thing limited in extent, and the better quality of soils more limited still, it is, in a country advancing in population, ever becoming more valuable acreably, and, by improved culture, increasing in intrinsic capability. With the price of produce remaining even stationary, the rent of land has thus a gradual tendency to advance. A fall in prices may, and does arrest the process for a shorter or longer period, according to the greatness and the rapidity of the fall; but only until the continuing march of population on capital, proceeding in steady and uninterrupted under-current, has again, by the agency of an increasing demand, become equivalent to the sudden expansion of the supply. During this temporary period, the investment of capital in land must be content to appear unproductive; though the agencies may be still at work as powerfully as before that will presently exhibit visible results, no present advance is shown. Yet, in reality, low prices, though in public appearance a depressing, are individually a stimulating agent. All complain, but each strives harder than ever to surmount the general depression, and it thus happens that periods of low prices in agriculture have commonly shown this apparent paradox—that, while complaint was universal, an unprecedented activity, the aggregate effect of individual effort, has been contemporaneously scarcely within the scope of the present inquiry. The moral argument in its defence has been summed up in the question, 'Shall the child be a beggar because the parent is a fool?' a question that would be conclusive could it be ascertained that the amount of folly is less, or the parental prudence greater, under the pressure of artificial restrictions unfavourable to active and salutary occupation. It is plain that estates do become worm-eaten within, let them be coated with no matter how many skins of parchment; and it is equally evident, on the other hand, that men grow rich and 'leave an inheritance to their children's children,' who entered life without the shelter of an entail, and passed through it without the go-cart of a 'family settlement.' It would be difficult, in fact, to find among the various forms of inherited penury one in which the suffering is more frequent than amongst that very class whose unborn interests the law so jealously attempts to guard.

We have hitherto directed attention chiefly to the legal *position* of the landlord. It remains to con-

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exhibited; leading uninformed or careless observers to suppose that the complaint of the wealthier and the distress of the poorer classes affected by the change were alike unreal.

sider the subject lastly, in that point of view which is commonly, taken first, namely, with reference to the duties of the landlord in those cases where his power, both legal and pecuniary, is equal to his will. What has been already said may have suggested one axiom which, once clearly understood, reduces into very simple definition the duties involved. Of all the encouragements to the tenant-occupier that exist, of all the stimulants to improvement that can be devised, the surest, and the most permanent, is to make every tenant feel that the farm to which he devotes his labour and capital is HIS OWN. 'Give a man the *secure possession* of a bleak rock,' says Arthur Young, 'and he will turn it into a garden: give him a nine years' lease of a garden, and he will convert it into a desert.' Without going the whole length of the latter part of this proposition, we may nevertheless take the broad principle it asserts as the touchstone of all true suggestion that can be offered in reference to the relation that exists between the landowner and the farming occupier. A relation purely factitious, and founded in no natural or necessary condition of mankind, open to the action of a perfectly free will on either side to arrange its terms by special agreement, or to accept that which the law supplies, such as it may be, is one, in which the attempt to dictate a string of imported obligations has a tendency to mislead those who, like the tenant, most require to be guarded from acting on erroneous assumptions. To be able to 'do as he likes with his own,' is fortunately a definition of human privilege, the whole boast and extravagance of which exist only in the sound. A thousand obligations and influences surround the will and conduct even of the most apparently irresponsible and unfettered owner, controlling him by an operation far better and less easily evaded than legal compulsion, to consult his own interest by considering that of others. In the capacity of landlord, nothing but a knowledge of his own true interest is wanted to render this principle effective, to a degree unsurpassed, if indeed equalled, in any other relation which one man can bear to another. To realise the feelings of the tenant; to put himself imaginarily in *his* position, so as to be able to enter into his wants, from his point of view, is a recommendation, which, approaching as it might seem to do almost within the scope of moral advice, is, however, a recipe that might be given and taken by the mere utilitarian. If it be true that the best tenant is he who treats his land as if it were his own, it can scarcely need proof that the best landlord is he whose tenant is least made sensible that he is not his own landlord. Paradox as this may seem it is the only statement that approaches the whole truth of the case. The relation is one of that class, which, like the functions of animal life, are most healthily discharged when they are not felt.

But this freedom of relation is one that can only be attained in its fullest perfection under the clear and comprehensive security afforded by a lease. It has been common for many years past to hear much complaint and surprise expressed at what has been taken to be the reluctance of landowners in England, as compared with Scotland, to grant leases. Political causes, and considerations relating to the preservation of game, have been generally assigned as the principal grounds of this reluctance—reasons more suited to aggravate than excuse the charge. But in truth to any one personally cognizant of the facts of the case, or investigating them for himself, apart from the somewhat declamatory tone that has been used upon the subject, it will have seemed that the want of a more general system of leases has neither arisen from the reluctance of one only of the parties, nor has depended, as a general rule, and putting aside exceptional cases, upon the causes above alleged. A deeper cause has been at work, operating equally, though from different aspects, both upon the landowner and the tenant. The continual, though irregular declension of prices of farm produce on the one hand, the sustained and often extravagant competition for farms on the other, and the irreconcilable diversities of opinion and calculation as to 'future prospects,' according as different minds were affected by occasional approaches to the high prices formerly remembered, or on the other hand by the discouraging apprehensions of the effects of the abolition of the corn laws, combined to render a lease, for any considerable term, so difficult of arrangement, that comparatively few men of capital were found ready to risk themselves to an offer such as would induce a proprietor to part with his land for a long term. A continuance of the system of tenancy from year to year, even in the case of tenants of large capital, was the almost inevitable result, although generally disapproved and cried out against.

Proposals have been frequently made during the period above alluded to, to relieve this and other causes of uncertainty by the adoption of a system known under the name of corn rents. The fluctuations in the value of gold, as in the case of the return to cash payments in the year 1819, have operated not less severely upon the payers of money rents than a decline in the value of farm produce, and it has been thought that both cases might be fairly and equitably met by a calculation of rent, regulated annually, or for longer periods, by the price of grain; and the proposal still occasionally finds advocates, who confessedly rely on the assumed hypothesis that the value of land to rent depends upon the market value of its produce. Plausible as the theory may seem, more especially when looked at against the background of a system of agricultural legislation proceeding upon a similar supposition, it is directly at variance with the whole historical experience even of the period during which, if ever, it ought to have received confirmation. Probably there is no uncontradicted assumption which has been a more fertile source of miscalculation and disappointment than this, and none which it would have been more to the interest of the farming body to have had boldly confronted by the facts, however paradoxical they might appear. Like every other article of limited supply and of improvable capabilities, ever opening out afresh, as skill and farming knowledge have advanced, land, both for hire and purchase, has a market of its own, regulated by intrinsic causes and principles, amongst which the price of its grain produce stands in a position altogether subordinate to many other relative circumstances which in every advancing commercial country are in constant course of development and change. No one would question that the extension of a neighbouring market—the improvement of the roads leading to it—the opening of a lime-kiln, where the article was needful and deficient—the construction of a canal or railroad through a remote district, and other causes of a similar kind, would locally operate to enhance the value of particular farms lying contiguous to the advantage; but the *general* effect of such causes, infinitely more numerous than those specified, and acting in the aggregate over the whole country, is not so readily noticed and accredited; and it requires an actual reference to the history of the inverse progress of rents, with the prices of grain since the early part of this century, to exhibit the fallacy of assuming the price of produce as the standard of the annual value of land, even for purely agricultural purposes. The invention of a good implement, such as the clodcrusher or the drill—the discovery of a new and powerful manure, like guano—the adoption of an improved process or system, as, for instance, that of the autumn cleaning of stubbles—any and every cause, in fact, which enables a larger amount to be grown on the same acreage, or the same amount to be raised at less cost, has an inevitable tendency towards two results commonly and erroneously thought incompatible, namely, to lower the market price of produce, and to raise the value of the acre which supplies it. But when to these causes is added the general increase of the whole population, viewed as a consuming class, and the special increase of that class in which each individual is the competitor of the other for an article limited in extent like land, we might expect *à priori* to see that the price of produce, even if every description were included, instead of grain alone, would bear no direct or fixed ratio with the value of land, any more than the rent of a factory would be ruled by the market prices of silk or cotton, which improved processes of manufacture have, without any such result, lowered to a degree that would once have seemed incredible.

It has been traceable, in no small degree, to a system of legislation, built and supported upon the erroneous theory which assumes market-price as the index of profit, that so much of disappointment, arising both from miscalculation and over-competition, has long been predominant in agricultural speculations. The sanction, and obtrusion upon the public mind, of a principle in itself illusory, and practically contradicted by trade-experience, becomes more mischievous, in proportion as it is readily embraced by the natural self-interest and love of ease which leads men to seek in advanced price an apparent gain, less troublesome than that which is only permanently to be found in reduced cost of production. The latter is, no doubt, the harder problem, and demanding the more active energy of the inventive faculties; but to this it must, and does come in the end, and the policy which postpones it, even for a season, has no consequence more fatal than the infirmity of invention which it naturally fosters. It would surely be more conducive to general intelligence, and to a true basis of dealing between the owners and occupiers of land, that everything in the shape of fallacy should be banished from the grounds on which their contracts with each other are formed. Quality of soil, climate, situation with respect to markets, suitable buildings, and other requisites for the conversion of produce, and above all, perfect freedom of action, and security of tenure and of investment on the tenant's side, are only a few out of many circumstances pointing towards a principle of valuation far more steady and determinate than the changeful price of an article affected, as corn is, not only by particular seasons, but by cycles of considerable duration. It may be doubted, generally, whether the recognition of the price of corn as connected with the question of rent, has not been in practice always deceptive and disadvantageous to the tenant, subjected as he is to a competition ruled by high, rarely by low prices; it must at any rate in the end be better for all parties that this, like every other question between proprietors and tenants, should be candidly approached, and fully understood, and that engagements should not be entered into, on either side, with any blinking of truths which will afterwards assert themselves, bringing disappointment with every discovery of miscalculation too late to be rectified.

The contract entered into between the landlord and tenant, in agriculture, may be practically described as an agreement for the employment of one capital upon another. The capital on one side is a fixed one; namely, land, with the buildings thereon erected;

that on the other is a floating capital, to be employed in the cultivation of the land by the tenant, gradually becoming fixed, as it is from time to time invested in the land, increasing its productiveness, by operations more or less permanent in their nature. Whatever may be the medium agreed upon between the parties for mutual security—since mutual security is evidently required—it will best answer the interests of both, if it neither fall short of, nor exceed the clear and simple definition of the objects desired, and the terms agreed upon on both sides. The argument for leases is the obvious necessity for such security, as well as to provide a clear definition of the respective rights of the parties: a main argument against them, on the tenants' side, is that they are apt to exceed this purpose, by arbitrary, useless, or antiquated covenants: another objection to them, raised on the other side, is the want of reciprocity of advantage practically experienced by the landowner, in cases where the capital of the tenant proves inadequate to the due cultivation of the land, and it becomes, consequently, neglected. The expense of keeping up a certain average state of fertility and cleanness in the soil is small, compared with that of restoring either.

Assuming the existence of an average condition at the commencement of the term, it seems plain that the reduction of it is an infringement upon the fixed capital represented in the farm. But this rarely happens in practice, except where there is a deficiency of the requisite funds on the side of the tenant. But as a legal instrument, defining civil rights, can pursue them virtually no farther, for either party, than the solvency of the other extends, the security afforded by the lease to the party whose capital is fixed and open in its nature, becomes dependent upon a thing very difficult of proof, namely, the corresponding money capital of the other. These objections to the lease, felt rather than expressed, on each side in turn, have rendered the use of leases less prevalent than the great advancement of husbandry in England would have otherwise ensured. Nor must the disposition to act upon a feeling of mutual reliance, engendered by the felt inadequacy of a lease to meet the exigencies of an extended term, be too hastily condemned.

Few farming tenants are practically ignorant of the fact, that duties strictly defined by a deed are apt to be narrowly construed; and in the free and liberal dealings which should, for their mutual benefit, subsist between a landlord and tenant, the frigid observance of a few defined obligations on the part of the landlord offers but dry encouragement in a course of landed improvement where every step developes new wants which no foresight could have anticipated, or embodied within the four corners of a technically worded lease. Every covenant and clause of such a document has moreover its negative as well as positive side, and may as often operate to shut out some request or service which occasion may call for, as to encourage or enable it; a consideration of some weight at a time when agricultural improvement discloses every day fresh features and occasions, which no legal document of ten or twenty years' standing can be expected to have anticipated or provided for. It has been well observed, too, that the longest lease passes, during its effluxion, through every variety of *short* lease, till, at last, it is tantamount to no lease at all. A lease for twenty-one years is only good, for the purposes of investment, during the first half, or at most, two-thirds of its term; after that time, it becomes no longer a current security for outlay on the part of the tenant; every year his calculation must thenceforward be made upon a diminished prospect of enjoyment, and with the assurance, in the generality of cases, that its expiration will bring with it terms of renewal, in which he will be lucky if his own improvements are not in some degree valued against himself. It is difficult from the very nature of land-tenancy to guard against this, for it is difficult to use land according to the best system of farming for a course of years, without so adding to its permanent condition, as to make it the basis of calculations of improved value, in which the owner of the soil claims his share, often, it may be, fairly, but always under circumstances difficult of nice discrimination, and in which the ex-lessee is in an unfavourable position to negotiate.

Such have been the arguments against farming leases; but it may be reasonably hoped that henceforward these objections will cease to stand in the way of their general adoption upon a defined and well established system. No evident reason can be assigned why a system which has operated with such admirable effect in Scotland, and in some of the more advanced districts of England, should not be universally applicable. However numerous the instances, honourable both to landowner and tenant, of capitals invested upon the faith of what is called a 'good understanding,' it is obvious that the existence, and mutual preference of such a mode of tenure, must have arisen out of circumstances in their nature exceptional; since in no other business relation of life do men mutually prefer thus to sit loose with each other, preferring personal and undefined terms to those which are absolute and definite, and guarded against the casualties of death, change of ownership, and the other liabilities which render even the best personal understanding ephemeral and uncertain, and the investment of capital marketably insecure.

It is not proposed in this place to enter into the detailed consideration of the lease further than to remark that both in the terms for which it is usually granted, and in the multitude of covenants commonly introduced, great error has arisen from an obstructive adherence to the practices of an obsolete system of agriculture. It is needless, in the present day, to insist upon the folly of attempting to import into a document of this kind a sort of penal code of agriculture, prescribing how a farmer shall conduct his own business. The inducement to exhaust land of the special elements of fertility taken up from the soil by cereal crops, by sowing them successionally, without the intervention of root crops or others of a restorative kind, hitherto an active excuse for the introduction of interfering and prohibitory covenants, is weakened by the reversal of a legislative policy which, whatever its other features, exercised during its existence a mischievous effect chemically demonstrable in tampering with the natural relative values of the different kinds of farm produce, misleading the needy or ignorant cultivator from that salutary rotation of crops which practical experience, confirmed by scientific discovery, has dictated as the most really profitable, because the most economical of the natural reagents existing in the soil and atmosphere.* A just and fair security on both sides is the one sole and simple object which should form the basis of the contract between the owner and the farming occupier; on the part of the owner, that his land shall, at the end of the term, be restored to him, in the same state of *cleanness* and fertility as that in which he parted with it; and, on the part of the tenant, that the capital invested in it during his occupation, whether by addition in the way of fixture, or by actual incorporation with the soil, shall be restored to him, either during the currency of the lease, or on its expiration, by competent valuation. Resort to a complicate and difficult office the latter course must always imply, regard being had to the nature of the soil as an investment, and its relation to circumstances so difficult to embrace into a calculation. But such difficulty and complexity are inseparable from the very nature of the soil itself, as a subject of temporary hire between man and man; it has no inherent laws of its own providing or adapting it for such a condition;

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* It is strange, that amongst the various arguments on both sides of the corn-law discussion that extended at intervals over the first half of this century, in England, the only one purely *agricultural* in its source and bearing, and capable of the closest logical compression, seems to have been overlooked. Its formula would have been to this effect:—The best husbandry recognises the alternation of cereal produce with root, leguminous, or other 'green' crop, as involving the truest economy and profit which the natural powers of the soil admit of; in other words, human-food and animal-food crops (taking the word 'animal' here in its narrower sense) have a natural alternating relation with each other. Any artificial cause which stimulates the production of the former alone, or in immediate succession, tends to encourage a breach of the *covenants of nature* written irreversibly in the living chemistry of the soil. The broken balance of true husbandry can only be repaired by an equivalent in purchased manure. The cereal produce taken *out*

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of course must be either *purchased* or *stolen* from the soil: its legitimate and economical increase can only be made *pari passu* with the increased growth and consumption of green crops stimulating the *acreable* return of the corn crop, and not by a law encouraging its *frequency*. On the other hand, any cause advancing the consumption of meat tends to make the root-crop more intrinsically profitable (which has long been the great desideratum), and thus to reduce the *cost* of the increased acreable produce in corn.

its natural 'tenure' is that of ownership; its natural 'lease' is one that human life does not always outlast. The care and capital it swallows, it digests and *assimilates*; its resulting 'condition' may indeed be judged of by marks significant enough, though infinitely variable in degree; but it is a hard task even to the most practised eye to unravel the complex tale, and to distribute to each claimant as 'owner,' and 'occupier,' his respective share, from an aggregate which nature inexorably fuses into one undivided annuity, often long deferred, sometimes sunk out of sight in a cycle of unfavourable seasons, and always bearing actual ratio, not to the extent of the outlay, but the skill with which it was applied.

But the interests of the landowner are not limited to the permanent improvement of the soil, nor his duties to the encouragement which security of tenure and investment, and freedom from useless restraint, afford to the farming tenant. There is another class for whom the barbarism of ancient, and of some more modern laws, has left much yet to be accomplished. It is true that the LABOURER is no longer a Serf, *adscriptus glebœ*, as in feudal times; but it may be doubted whether the operation of a law, dating nearly from the time when his emancipation from personal tyranny was obtained, has not inflicted on him a evil often more grievously felt. The operation of the law of settlement, in making it the interest of every parish to get rid of its cottages, and in the face of increasing population, to reduce to the utmost degree the country dwellings of the labouring class, has been only less sudden and violent in its cruelty than the early devastations of the Norman tyrants, which depopulated whole districts for the sake of hunting-grounds. The mind of the public has been recently made familiar with cases, in which agricultural labourers have had to perform distances equalling the day's march of a soldier, in addition to their own work, in the mere going and returning, morning and night, from their labour, through the absence, or rather the deliberate abolition, of all cottage accommodation in the parishes where their work lay. Fever and disease, the result of over fatigue, have in consequence helped to swell the list of pauperism. The unproductive labour spent upon these idle marches to and fro—the temptation to the ale-house, to which they generally add opportunity as well as force—and this, too, as the consequence of a law having for its object the benefit and maintenance of the poor—may furnish matter for earnest consideration to the land-owning class of this country, in whose power it mainly lies to mitigate the evil, by increasing the accommodation and comfort of the labourer, through whose toil and sweat the earth is made to yield her increase. For some time past, a lively interest has been taken in this subject by some of the most philanthropic men of the age; for, both in town and country, the defects of the dwellings of the poor have been felt to be a reproach to our civilisation. There are, however, no doubt, obstacles in the way which are difficult to be overcome. The question of expense first presents itself. Cottages have been erected, upon some estates, which have shown a vast improvement in their structure and internal arrangements; but the cost of their erection, compared with the ordinary rent which a cottager is able to pay, has seemed to preclude the idea of their general adoption. Considerate landlords have nevertheless provided, in many instances, convenient and comfortable accommodation for the workpeople on their estates. But further experiments will be required, both in the materials and in the mode of construction, before any extensive effect will be produced in the objects contemplated. It will be required to be shown that, at a cost, if not smaller, certainly not larger, than that hitherto incurred in the building of cottages generally inadequate to the wants of a labourer's family, houses may be erected giving them the benefit of better arrangements, and providing for their increased comfort, cleanliness, and moral decency. The rate of wages, in most country districts, leaves but a small margin over, after the purchase of food and clothing, for rent; and this, in practice, sets a limit to the outlay upon labourers' tenements, which has hitherto had the effect of compelling them to live in abodes unfit for human habitation, tending to squalor and disease, as well as vice; and rendering life itself, to the mass of the poorer class of labourers, a following of a few inferior instincts with an utter blindness to consequences, and with an endurance of physical and moral evils which the daily habits of a decent dwelling would cause to be soon redressed. The disastrous consequences are sufficiently conspicuous, not only in the reckless and despondent habits produced among a class set loose from the domestic ties of a comfortable home, but in the recoiling expenditure annually levied by poverty and crime upon the rest of society, as the natural return for this neglect by the rich and better instructed, of their penury and disease-stricken neighbours. Doubtless, were the idea vitally present to the minds of owners and occupiers of land, that by moral laws, of unswerving regularity, the condition of the poor of every parish is reflected back upon them, in the form of county and parish rates—and that their attention to the physical and moral state of the class most exposed to poverty and crime, helps mainly to determine their own ultimate liability or exemption from these burdens—we should find a livelier interest taken in the well-being, and a corresponding change in the habits, of the poor. The abolition of the excise on bricks—the recent reduction of the duty on timber—and the probable changes of the law of settlement and removal of the poor—will all tend to the much desired end of supplying towards this desirable object the element of self-interest—the true adjunct of all practical philanthropy.

It is a dangerous kind of inattention which should overlook the beckoning example, actually under our eyes in the case of Ireland, of the devastation upon a whole country, and the recoiling effect upon its landowners, produced by the long-continued neglect of the natural duties of their position, by a careless, non-resident, and selfish proprietary, who have imagined that rights so pregnant and peculiar as those attending property in land could be enjoyed and squandered without the repayment of a single duty to the soil or its cultivators. 'Landed property,' says one who has been called the severest, but who is not the least accurate, of modern writers on economy, 'is felt, even by those most tenacious of its rights, to be a thing different from other property; and where the bulk of the community have been disinherited of their share of it, and it has become the exclusive attribute of a small minority, men have generally tried to reconcile it, at least in theory, to their sense of justice, by endeavouring to attach duties to it, and erecting it into a sort of magistracy, either moral or legal. The community has too much at stake, in the proper cultivation of the land, and in the conditions annexed to the occupancy of it, to leave these things to the discretion of a class of persons called landlords, when they have shown themselves unfit for the trust. A man whom, though only one among millions, the law permits to hold thousands of acres as his single share, is not entitled to think that all this is given to him to use and abuse, and deal with as if it concerned nobody but himself. The rents and profits are his, and his only; but with regard to the land, in everything which he does with it, and in everything which he abstains from doing, he is morally bound to make his interest and pleasure consistent with the public good. The species at large still retains of its original claim to the soil of the planet which it inhabits, as much as is compatible with the purposes for which it has parted with the remainder.'

It is scarcely too much to assert that, in a country like our own, rapidly advancing in the elements of material wealth, the position of the resident landowner presents the widest scope of moral capability, in the most variously inviting field of practical studies and duties, which can fall to the lot of any individual in private life. Its comparative leisure—the highest gift which competency bestows, and which superfluity cannot add to—is at once its greatest privilege, and, rightly considered, its strongest tie to the pursuit of important and humanising objects, which lie open, in the same degree, to no other condition of life. It presents the pursuit of gain in a form sufficiently attractive, without over-exaction, and in alliance instead of conflict with natural pleasures, whilst it caters to the love of distinction inherent in most minds, by a prominence almost inseparable from the position it confers. That imitative faculty of our nature, which gives to example almost the effect of law, invests it with a commission both wider and higher than even the magisterial authority which commonly forms one of its leading duties; whilst the daily recurring problems presented to it, in the whole round of rural economy, and the wide sphere of scientific and practical knowledge involved in them, demand a breadth of education, in the truest sense of the word, certainly not inferior to that required for any branch of professional life. In default of other improvement of education amongst the agricultural classes, a source more central and more powerful cannot exist, or whence an easier dissemination of knowledge should emanate, than that presented in the person of one whose influence is so extensive, and early advantages commonly so great, as those of the owner of the soil.

THE BATTLE-LINE OF HISTORY.

A LECTURE, DELIVERED IN THE TOWN-HALL, LEOMINSTER, AS ONE OF A SERIES OF LECTURES FOR THE WORKING CLASSES, DURING THE WINTER OF 1863.

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The following pages make no pretension to originality, either of design or treatment. The whole merit of the view taken of the history and philosophy of battles is due to Sir Edward Creasy's useful and eloquent work, the parent of all which have since appeared on the same subject. It was my chief object to bring some of the main features of this work, and the world-survey it unfolds, by means of the popular and epitomised form of a 'Lecture,' within the compass of an hour, and the comprehension of the audience to which it was addressed. For this purpose I had to refer again to most of the original authorities; for the task of compression, without obscurity, is one requiring careful analysis.

In the account of the later battles, I have of course availed myself of many works that have appeared since that of Professor Creasy was written.

January 1864.

IT has often been to me a subject of reflection, and regret, to think how many of those who are born into the world live and die without having ever had the least knowledge of what has taken place in it before their own time. For thousands of years men have come and gone, and scenes and actions have taken place which would thrill your hearts to hear of; and those scenes and actions have been so exquisitely told, clothed in language of such power, and life, and sweetness, that the least instructed of those I see before me this evening would almost sit out half the night to hear such tales told in such words—of the brave deeds done in the olden times by those who have long passed away from the earth.

This knowledge is called History. No story-book that could be written would contain so much that is amusing and exciting; and no sermon that ever was preached embraces so much of the material action of the hand of God—of the outline of His dealings, in bringing to pass His great purposes with mankind, so far as this earth is concerned. It is true we all learn, from the Bible, the history of the Jewish people, and that history includes some mention of Egypt, of the Assyrians, of the kingdom of ancient Persia; and the New Testament introduces the name of the Greeks and Romans. We could not, even historically, have a better beginning, for it goes up to the very source of all knowledge of our own race.

But the human race spread far and wide over the earth, peopling the vast continents of Asia, Africa, and Europe; while the country of the Jews was for special and final purpose confined to a very narrow spot, with a sea, and a rock-bound coast on the west, a pathless desert on the south, and holding no willing intercourse with the great nations which lay far away on the northern and eastern sides. It lay alone among the nations. Its policy and its law were to have nothing to do with them; and the history of the world, seen from a Jewish point of view, seems like a landscape looked at through a telescope inverted, which makes the greatest objects appear very distant and very small.

But even in the Bible history we see how great a part was played by Battles; that it was through battles that the Jews themselves were established in Judea, a country not larger than our county of York. And when we cast our eyes from that little territory over the world that lay outside it, we shall find that it was by great battles that the progress of the whole world was determined, and that it has been through a long succession of battles, from the most ancient times down to the present, that we ourselves have come to be *what* we are, and *where* we are. The mixed blood which runs in our veins, the very language we speak, are derived from a succession of widely different tribes and nations, who have each been conquerors in turn; and the battle-field has been, humanly speaking, the great board upon which our very nature and condition have been moulded into their form. Whatever, therefore, may be our Christian hope that the time will come when war will be no more, we may look back with deep and enquiring interest to those great conflicts of nation with nation, and race against race, which have turned the current of human history, and directed the progress of Man.

It is a few of the most important of these that I hope to relate and explain to you; and this not for their own sake alone, but by means of them to furnish some idea of the thread which runs through the whole history of the world.

You are all familiar with the names of the three sons of Noah. Now these three names have been commonly received by historians as the parents of the widely different people of the three great continents known as The World, before the discovery of America. Our own continent of Europe is regarded as having been peopled by the descendants of Japheth, the greater part of Asia by those of Shem, and the sunburnt continent of Africa by Ham and his posterity. We shall not be far wrong in looking upon the earliest struggles of mankind as the trial for mastery between the descendants of these three brothers.

The first great battle that I shall try to describe to you is that ever memorable fight which first brought the descendants of Shem, the powerful and ancient tribes inhabiting the vast regions of Asia, face to face with the small but energetic republics that occupied the neighbouring coast of Europe. The quarrel thus began of

EUROPE *against* ASIA.

About twenty centuries and a half ago, nearly five hundred years before the birth of our Saviour, the great king Darius was one day feasting in the midst of his nobles, gathered from all parts of his empire, then the largest and most warlike upon earth—the far-famed Medes and Persians—when a messenger came, pale and breathless, and falling at the feet of the mighty monarch, informed him that a strange and unknown people, crossing the sea from the setting sun, and calling themselves Athenians, had landed from their ships, and joining his revolted subjects the Ionians, had, by a bold and sudden march, plundered and set fire to his beautiful city of Sardis, which was full of royal treasure. Darius, inflamed with rage at this intelligence, demanded who and what manner of men these Athenians were, of whom he had never heard before, and being informed, he called for his bow, and placing an arrow in the string, he shot it up towards heaven, and as it rose into the air he cried out, 'O supreme God! grant me to avenge myself on these Athenians.' And he charged one of his slaves to say to him every day, as he sat at meat, 'Sire, remember the Athenians.' He then sent forth heralds across the sea, to all the cities of Greece, to demand earth and water, the tokens of submission, in the name of Darius, the lord of all men from the rising to the setting sun. Struck with terror at the message, the cities of Greece one after the other obeyed; but when the heralds came to the two cities of Sparta and of Athens, they alone indignantly refused, and sent the messengers back with disgrace. Thereupon Darius, collecting all his armies from the utmost parts of his empire, embarked them in an immense fleet of vessels, under Datis, his most trusted general, to cross the sea to the opposite coast, with orders to attack the city of Athens, to burn it to the ground, and bring away all the inhabitants as slaves into the presence of the Great King. This vast force landed without opposition, in a bay close to the plain called Marathon, about two-and-twenty miles from Athens, about six miles wide and two miles across; and the immense army of Asiatics soon saw with ridicule, encamped on a rising ground before them, the little army of Athenians, numbering only ten thousand men.

We must now visit that little force, and see what they were doing. The Athenians had no king. They were at that time governed by ten rulers, called Archons, with one at the head of these, who was called the War-ruler. These chiefs were in deep council; and it was to be decided by their votes whether they should dare to attack the mighty force opposed to them at once, or wait for help from the Spartans, who had promised to join them, but had a long way to march. The votes were equal: five were for delay and five for immediate attack. The War-ruler, Callimachus, had the casting vote. Upon that vote depended—they little thought how much—one of the greatest questions that ever affected the destinies of the world; not merely the fate of two armies, but perhaps the whole future progress of human society. It was Asiatic tyranny against European freedom and civilisation.

At this critical moment an incident occurred—an act of unexpected gratitude—which helped to turn the history of the world. All the other cities of Greece had hung back in terror from giving aid to the bold men of Athens, except, as I have said, the Spartans; and their long march was delayed by a superstition, which forbid their starting on any expedition till the moon was at its full. From one quarter only, and that a most unexpected one, there came a handful of aid to the Athenians at their moment of utmost peril and feeling of desertion. Some years before, the little city of Platæa, being hard pressed by a powerful neighbour state, had begged for aid from Athens. The aid was sent, and it enabled the Platæans to retain their independence.

At the moment which I was just now describing, when Callimachus, the War-ruler, was about to give his casting vote, a little body of troops, admirably equipped, was descried winding through the hills in the distance, towards the left flank of the Athenians. As it approached nearer, it was seen to consist of only a thousand men—a small force, but they were the picked soldiers of the city of Platæa; and the gallant self-devoted spirit of the men of that band, for they had vowed to stand and die by the side of the men of Athens, made it of tenfold value, and went far to cheer the hearts of the Athenians in the solitary and unequal struggle that awaited them. This act of generous daring of the true-hearted men of Platæa was never forgotten at Athens. From that day forward the Platæans were made their fellow countrymen. This incident decided the vote of Callimachus, and it was given in favour of instant battle.

Their line of battle was then formed, and the left wing was given, as the second post of honour, to the Platæans. The little line of Greeks, still only 11,000 in number, was extended to its utmost length in the endeavour to present something like a front, and avoid being outflanked and surrounded by the wide-spreading hosts of the Persian army. But this extension was chiefly at the centre; the wings were each kept solid and deep, and the word was given to charge. Great was the astonishment of the Asiatic army to see the little force opposed to them advancing down upon them at a run!

But before EUROPE and ASIA come for the first time into close conflict, I must try to give you some idea what the shock of the charge between the respective combatants was likely to be.

Of all the people that have ever lived the Greeks took most pains in the cultivation of their bodily powers. From his earliest youth every male Greek was educated in the gymnasium. By constant daily practice of wrestling, running, bearing heavy weights, and every exercise calculated to develope every muscle of the body, each individual became a perfect specimen of athletic manhood. The Grecian Games are celebrated to this day; no length of running put the Greek soldier out of breath, no exertion fatigued him. A Greek army, however small, was an army of wrestlers fresh from training, able to carry heavy armour and heavy shields. Their discipline was so perfect that they could lock their shields together in front, and rush forward in a steady unwavering line of the most perfect formation. It was called a phalanx in the Greek tongue, and this word has since become proverbial in almost every language of the world.

On the other hand, the various Asiatic races brought together in the immense army of the Persian monarch were long accustomed to victory. Fighting in immense masses, with the aid of large flying bodies of cavalry, they had become irresistible by numbers, without much of individual action. Joined together only as the slaves of one great master, and of the Satraps, or lieutenants, under him, they had seen every smaller tribe brought under his dominion by their armies. But they had grown up in the effeminacy and luxury common in hot climates; and, though wild and fierce as the tiger in his onset, they were without self-reliance or patient 'pluck.' As they were then, they are to this day. They wore no body armour, the heat of the sun rendering that impossible; but they carried light wicker shields. In the days of 'war before gunpowder,' a shield was of course an essential part of a soldier's arms.

Great, as I said, was the surprise of the vast Persian army to see the thin line of Greeks, without cavalry or bowmen, suddenly bearing down upon them 'at the double,' like madmen, as it seemed, upon certain destruction! They prepared, however, in contemptuous confidence to receive them, as quickly as the surprise allowed. While they were still arraying their variously armed masses, on came the rushing wall of impenetrable steel, and down went the front rank of Asiatics, unable to stand the shock, or to inflict a wound upon men who appeared to them to be clothed in iron, as, indeed, they partly were. Still those behind the first ranks stood firm, and strove by weight of numbers to bear back the shallow thread of Europeans. In the centre, where the Medes and the ferocious Sakæ fought—the forefathers of our late foes in India, the Sikhs—they recovered from the first recoil, and the Greek line, being thinner at that point, was withstood; and then, at the price of tremendous slaughter to the pursuers, forced backwards, yielding ground, but never turning. But the right wing of the Greeks, under Callimachus, and the brave Platæans on the left wing, burst with irresistible force each through the left and right of the Persian army opposed to them, and drove it into headlong flight; but, instead of pursuing, each wheeled steadily round, and closing into one rank, charged in rear the central mass who were pressing on their countrymen; who, quickly perceiving the rescue, rallied their line, and the flower of the Persian army found itself enclosed, and fighting at heavy disadvantage with an enemy on front and rear, far their superiors in hand-to-hand encounter.

The rout was soon complete, and the hitherto unconquered lords of Asia were in full flight to their ships, pursued to the water's edge by the little army of Athenians, who strove to set fire to their fleet. Seven galleys were captured, but night coming on stopped the slaughter, and saved the remainder of the invaders, and their vessels; but not before they had lost between six and seven thousand of their number, the Greek dead being under two hundred.

The battle lasted but a few hours, for it only began in the afternoon; but in those few hours an important decision had been cast upon the future history of the world. Many attempts were made, indeed, by the descendants of that Darius against Greece; but the result of the first conflict was never reversed; and it was the field of MARATHON that ultimately secured for mankind the intellectual treasures of Greece, the growth of liberal institutions, and the ascendancy of the active principle of European freedom over the massive and supine despotism of the Asiatic race.

And now we must change the scene, and pass over many hundred years. Many a battle there was after this between Greek and Persian, till the crushing battle of Arbela, in which Alexander the Great, King of Macedon, attacked and completely defeated another Darius, and put an end for ever to the ascendancy of Persia, and the great Asiatic monarchies, which, thenceforward, may be said to disappear from the main thread of history; while the Greeks occupy the foreground of civilisation, not in war only, but by the cultivation of arts and sciences which have been the admiration of the world down to the present day. In poetry, painting, in sculpture, in architecture, in historical and philosophical writing, they have never been surpassed, or even equalled, by any nation upon earth. In most of these arts, the most accomplished men, even of our own day, are proud to be copyists and learners from them.

But all human things have their rise, their meridian, and their fall; civilisation itself never stands still; it is always (in every sense of the word) in motion, and it travels as the sun does—*westward.*

Now, to the westward of Greece, across the narrow Adriatic Sea, a nest of freebooters had settled upon the left bank of the river Tiber, in Italy; and their successful depredations upon the neighbouring towns and states spread wider and wider, till they grew into a powerful kingdom. Then, after expelling their kings, they became a republic, governed by a senate, and two consuls, as they were called; and finally it became the great Roman Empire, and mistress of the whole world then known. Indeed all the northern part of Europe, in which we dwell, only became known to history, as Rome made it known, by making war upon it. Every battle that we had with the Roman legions—I say 'we,' because the ancient Germans, who fought, and sometimes overcame the Romans, were our forefathers,—every battle, I say, was like the stretch which awakens the sleeper; it awakened us to the consciousness of life and power.

But as the growth of the republics of Greece was assailed by Asia, so in its turn the further development of Europe, in the progress of Rome, was destined to find its enemy in the continent of Africa, which lay to the south of it, across the Mediterranean Sea. It began in this way. You may remember in the Bible the mention of Tyre and Sidon, two commercial cities of the coast; these were founded by the Phœnicians, the great sea-traders, in fact, the only true sailors of the ancient world. So skilful were they in navigation, that without the aid of the compass, which was not then discovered, their ships had traversed the whole length of the Mediterranean, passed through the Straits of Gibraltar, up the coast of Spain, where they made a settlement at Cadiz, and penetrated northwards, through the stormy Bay of Biscay, along the coast of France even as far as our own coast of Cornwall, and the Scilly Islands, where they discovered and worked the tin mines, and went on even to the south-west coast of Ireland.

But of all the colonies founded by this enterprising people, the most powerful and independent was the city of Carthage. This flourishing colony soon eclipsed its Phœnician parentage, got possession of the islands of Sardinia and Corsica, and tried hard for the beautiful island of Sicily, which lay right opposite to it. But Sicily was also close to Italy, and claimed by the Romans, whose power in Italy was becoming supreme. And thus began the next great conflict of the world—the battles of the Carthaginians and the Romans, or

EUROPE *against* AFRICA.

Three hundred years had passed since the battle I have just described, on the plain of Marathon, where Europe had successfully defended herself from Asia, on the east, when this new foe appeared from Africa, on the south. Setting sail from Carthage, with a host of wandering tribes from the deserts of Libya and Numidia, one of the greatest generals the world has ever known passed across the sea, and landed in the South of Italy. His name was Hannibal. He had a brother named Hasdrubal, who, with himself, had been devoted at the altar by their father in their infancy to everlasting enmity against the Romans. They had vowed to destroy Rome. To ensure this object, Hasdrubal had been sent round, through Spain, to enter Italy on the north, and it was arranged that, Hannibal entering at the south, the two armies should meet in central Italy, and pour the tempest of their united vengeance upon the devoted city from north and south simultaneously.

Still, we must not regard this as a mere struggle between the two cities of Rome and Carthage. It was a strife on the event of which hung the fate, again, of two races of mankind; the European, or Indo-Germanic on the one hand, and the Semitic and descendants of Ham on the other. As the Athenians had been the vanguard and defenders of Greece and Europe against Asia, at Marathon, so now it depended on the Romans to roll back, if they could, the tide of African conquest in the fierce struggle that hourly awaited them.

But never had the Romans sunk to so low a condition as during the years of terrific warfare which had preceded this fresh invasion. The wild cavalry and the elephants of the African armies had year after year trodden down and destroyed their crops till famine threatened the city; and her army and people were reduced by years of contest with her relentless foe. She was bleeding at every pore, and there seemed little hope of her escape, if those two fierce 'lion's whelps,' as the brothers Hasdrubal and Hannibal were called, should unite in a death-grapple upon the exhausted city. To prevent this it was necessary that Rome should put forth all the strength she had left. Two armies must be forthwith provided in order to march at once, one to the north, the other to the south, to meet the two fierce invaders, coming from opposite quarters. Now, every Roman was a soldier; for these people were not, at the time I speak of, like the Greeks I mentioned just now. The Romans had no love or taste for the arts of peace. The very language they spoke was the language of men to whom it was easier to fight than to *think*: they loved and lived on ar; but just now they had had enough of it. They had met their match, and more, in these swarthy African brothers;

and the life and death conflict they were now compelled to, would settle the question for ever, whether Rome should exist any more. So every man who could bear a sword and a shield marched out of Rome with one or other of the two armies, that for the north under the Consul Livius, that for the south under his brave colleague Claudius Nero. Wives and daughters, old men and children, escorted them out of the city, with prayers and sad forebodings, beseeching the gods to grant them safety, and a victory they could little expect. In the expressive words of the historian, they 'marched on without fear, but without hope.'

Meantime Hannibal, who had landed in the South of Italy with his army, was obliged to wait a long time while his brother Hasdrubal was performing his long march round through Spain, and across the Pyrenees, and over the Alps; and when he had accomplished this tremendous circuit, it was of course necessary that he should communicate with his brother to let him know the time of his arrival in the North of Italy, that they might unite their forces at Rome according to appointment. But Hasdrubal performed this astonishing journey long before his brother expected, and despatched messengers to inform Hannibal of his arrival.

But this was no easy task. The country of Italy from north to south is long and narrow. Rome lies about half-way. There was a distance of more than 200 miles between him and his brother's camp in the south. Rome itself and its two armies that had marched out of it, had to be passed. Yet the messengers of Hasdrubal traversed the greater part of their dangerous journey in safety; but when close to the end of it they were captured by a Roman detachment, and Hannibal's letter to his brother, detailing the whole plan for their meeting and assaulting Rome, was laid, not in his brother's hands, but in those of the active Claudius Nero,* who saw in an instant the full importance of the crisis. The African brothers were now within 200 miles of each other; and if Rome was to be saved, they must never be allowed to meet alive.

So, to prevent this, Claudius selected six thousand of the bravest of his army, and a thousand cavalry, and starting at nightfall, left his own camp, hardly aware of his departure. Day and night he pushed forwards, explaining to his chosen troops on their way that he was leading them to join the northern army that lay far away, opposed to Hasdrubal. The soldiers caught the full spirit of their enterprising leader: every cart and horse and carriage of every kind on the road was brought by the willing peasantry to help the foot-sore soldiers on their forced march, so that they never halted day or night. Couriers were sent forward as they got near the end, to inform Livius of their approach; and the last day's march was so timed that they should reach the camp of Livius in the night; and they were received silently into the tents of their comrades.

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* The name of this great soldier must not be confounded with that of his depraved and effeminate namesake, the persecutor of the Christians, in a later century.

Up to this time, Hasdrubal had been anxious to bring Livius to battle, but did not dare attack the Romans in their camp. But when the next morning dawned, he was surprised to see the red ensign, the token of immediate battle, floating in the sky; and his practised ear caught the sound of a fresh trumpet, betokening the presence of another general; and he remarked too, on reconnoitering their line, that a portion of the troops drawn out looked travel-stained and rough, and that the line was more extended than usual. Puzzled and alarmed as to the cause of this;

fearing that some miscarriage of his brother in the south could alone have enabled the double Roman army thus to have united before him, he determined to avoid the encounter, and led his army back into their camp; and at nightfall he withdrew further back, in the hope of crossing the river Metaurus which lay behind him, and placing it between him and what he believed to be the whole body of his foes, fresh from a victory in the south over his brother Hannibal. But his guides deceived him, and instead of showing him the fords of the river, led him away to its deepest part and left him and his army wandering in confusion along the steep bank, where the stream was impossible to cross. The Roman cavalry was soon seen coming up in pursuit, followed at no great distance by the Legions. Further retreat was impossible. So he rallied his ranks as quickly as he could for the instant battle that threatened them, and placed his elephants in the front, in the hope of striking terror into the Romans, still unaccustomed to the sight of them, giving orders to their drivers to slaughter them immediately should they become unmanageable and dangerous to their owners, as was not uncommonly the case. A tremendous conflict ensued: the Romans, confident in their augmented numbers, and that they were charging a retreating foe; the Carthaginians fighting for their lives, with the dark deep river behind them which offered no escape. During the battle, Nero, perceiving that the left wing of the enemy (consisting chiefly of Gauls and Ligurians who had been only pressed into Hasdrubal's service on his march, and stood opposed to him) refused his attack, and protected themselves by some high ground, wheeled off a brigade of his best men round the rear of the Roman army, and bringing them to the other side, attacked suddenly the flank of the right wing commanded by Hasdrubal in person. The charge was as successful as it was sudden: rolled back in disorder, the Africans yet fought gallantly to the last; and Hasdrubal, after doing all that a brave general could do, but seeing that all was lost, dashed sword in hand into a Roman cohort,* and met a soldier's death, worthy of the son of Hamilcar and brother of Hannibal. Success the most complete had thus crowned Nero's enterprise. Returning to his own army in the south as rapidly as he had left it, he was again in his own camp 200 miles away, and again facing Hannibal, before the latter was even aware that he had left it. But he had brought with him a ghastly trophy of what he had done—the head of Hasdrubal, which he ordered to be thrown into the camp of Hannibal! A touching description is given of the agony of the brother at seeing the face of him whom he had parted from, full of hope and expecting to meet flushed with victory, at the gates of Rome, now glazed in death, and telling only too significantly the utter discomfiture of their joint enterprise.

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* The *Cohort* would about answer to our 'Battalion,' the *Legion* to a large 'Brigade.'

Well might the people of Rome be transported with joy at this unexpected deliverance. Hannibal was indeed still alive; but the hope of his enterprise was gone, and was destined never to be recovered. Viewed as a military exploit, this march of Claudius Nero, followed up by his bold and skiful manœuvre during the battle, is almost unrivalled in the history of warfare. In its results it may be said to have freed Europe from an African yoke. Never was the hand of providence more manifest than in the issue of the struggle between Rome and Carthage. Hannibal was a general whose resourcefulness, courage, and indomitable perseverance deserve our utmost appreciation and sympathy. But it was for the good of mankind that he should be conquered: his triumph would have arrested the progress of the world.

And now we must turn over centuries and centuries, like so many pages. They are strewn with battles as thickly as a spangled robe; and many of them far more brilliant than those which I present to you to-night. But the battles that I tell you of are only those which have guided the destiny of mankind; and to them centuries are but the cord on which the purposes of Providence are knotted, sometimes at long intervals, sometimes at short. For, what is time to the Eternal in whose sight a thousand years are but as a day?

After the defeat of the Carthaginians the Roman empire grew city by city, country by country, till it spread its haughty pagan power from east to west, from south to north; but within its swollen territory there grew the canker of corruption, and the first blows that its tottering bulk received were from our own forefathers in the deep forests of Germany. But the great mission of Imperial Rome was accomplished when she had absorbed and transmitted through her wide dominions the civilisation of Greece, and all *that* had derived from the more ancient world of Egypt and the East; when she had broken up the petty sovereignties of the various states and tribes of the earth, and bound them together by one great system of law and government. Under her far-reaching sway the Christian faith was born upon earth, and she sheltered the nursling without knowing it, and covered the little seed, that grew and grew as she declined, and striking its roots into the prepared soil of her decay, spread its branches to the very confines of her dominions. One is reminded of those 'dissolving views' in which the pale hues of winter are gradually converted and warmed up into the glowing tints of summer, by the marvellous transition which during the progress of a few centuries changed the wide confines of *pagan* Rome into the Christian empire of the east and west. Every blow that fell upon her, hewing down bone by bone the colossal skeleton of her greatness, revealed, in its place, a growing form of living flesh and blood, the traces of a coming sovereignty of a far different kind destined to spread eventually over the whole earth. We may speak of the decline of the Roman empire, but we may hardly speak of its fall. It never fell; it moulted.

But scarcely had six centuries passed from the birth of Christ, before the old enemy reappeared under a new form. While Christianity was spreading over Europe, a new religion was rearing its threatening form among the descendants of Shem and Ham. Commencing in Arabia, the country of the Prophet Mahomet, the Mahometan Arabs burst forth in irresistible swarms, carrying before them a tide of conquest westwards through Persia, Syria, Egypt, and North Africa. Thence, under the name of Saracens, they crossed the Straits of Gibraltar, invaded and conquered Spain, and at the opening of the eighth century the name of the Prophet Mahomet was invoked under the Pyrenees, the barrier which separates Spain from France.

I should like to have time to say a good deal about these Saracens, or Children of the Desert, and to bespeak for that name a good deal more respect than we are wont to attach to it. If the kingdom of Spain was half as rich or well cultivated in the present day as it was when they possessed it, it would be one of the richest instead of the poorest countries of Europe. And the same may be almost said of every country into which their rapid career of conquest led them. Their love of AGRICULTURE, strange to say, was a national passion; their splendid works of irrigation in Spain, in Syria, and other hot and mountainous countries, are, even in the vestiges that now remain, the wonder and admiration of travellers; and the unequalled palace-city of the Alhambra, in Granada, attests what they were in ARCHITECTURE. We owe to them the common figures of ARITHMETIC which we use for daily calculation. Conceive only for a moment a long banking-account attempted to be expressed in Roman numerals! ALGEBRA, the science of uncertain numbers, and the solvent of all our deepest engineering problems, we owe, as its very name attests, to them. ALCHEMY, another Saracen word, is the parent of the great science of chemistry, the very basis of all knowledge of the properties of matter. Their skill in ASTRONOMY enabled them to predict eclipses, and measure the eccentric orbits of comets, at a time when these phenomena were the terror and imaginary scourges of the world to the nations sunk in ignorance around them. I do not think I should be far wrong in pronouncing them the most genuinely scientific, and, in that sense, accomplished race the world has ever seen.

It was under one of their ablest and most renowned commanders, with a veteran army 80,000 strong by their own account, according to the less trustworthy monkish writers three times as numerous, and flushed with recent conquest, that the Arabs crossed the Pyrenees, and, in their great effort at the conquest of North Europe, brought to final issue the contest long to be renowned in the poetry as well as history of Europe, the contest of

CHRISTIAN *against* MAHOMETAN.

Unhappily for history, this great struggle between the Crescent and the Cross, without doubt the most important the world has ever seen, has not been chronicled in such a manner as to enable me to give you a really detailed or clear account of it. The ridiculous exaggerations of the monkish writers coined under the terror of the Saracenic invasion, and then after its defeat let loose into a whirlwind of triumph and imposture, make it very difficult to extract even the germ of truth or probability. This, however, is certain, that the Saracens, after penetrating successfully through the south of France, as far as the plain where the city of Tours now stands, overthrew with ease the first army that attempted to resist them, under the Count Eude. It would seem, however, that the spoil they captured from the vanquished Christians, and were obliged to carry with them in their onward march, was the immediate cause of their grand overthrow in the next encounter that awaited them. This ever memorable battle was led on the part of the Christians by the hero Charles Martel, king of the German Franks, and grandfather of Charlemagne. Few battles had ever been fought in which the numbers were so great. Had Charles been defeated, the religion of Mahomet would have spread like a flood-tide over the whole of Europe. After the first day's terrific slaughter night parted the combatants. If the monks may be believed, this struggle went on with changing success, but unalloyed butchery, for five days; but the most trustworthy account represents that after the first day's slaughter, it was renewed in the grey of the following morning, and the Mahometans had penetrated into the centre of the Christian army, when a panic cry was raised in their ranks that the Christians had got into the rear, and were seizing their camp with all the women and all the spoils which they had brought with them on their march. And while their great leader Abderahman was endeavouring to rally them from the momentary retreat occasioned by this panic, a small body of Christian knights marking the conspicuous warrior, rushed forward, cutting their way through to where he stood, and he fell under their united attack, 'pierced through with many wounds.' The cry of his death turned the panic into a rout; and before night the Moslem army that had advanced from the Spanish frontier in such pride and pomp was almost cut to pieces. This was the first signal overthrow of the Saracenic or Moorish race in Europe. They remained in Spain for several hundred years afterwards; but this important victory, called the 'Battle of TOURS,' checked once for all the tide of their further conquest, and the progress of the Christian nationalities of Europe was henceforward set free. In other words, the European nations, having now done defending themselves against their foes of Asia and Africa, began from this time to fight against each other. And now we may pass over three centuries, and draw our attention nearer home. For the next great battle that I have to tell you of affects us very closely, and was fought on English soil, being the struggle of

NORMAN *against* SAXON.

Whoever has travelled from London to St. Leonard's will have seen as he approaches the Sussex coast a long chain of little round forts, or low towers, each surmounted by a single gun, most of them now, happily, pointed inwards to the land. They point over an extensive plain, running inland for many miles, which looks as if it had been once covered by the sea. Along the east side of that low plain there runs a high ridge of hill, beginning just behind the town of Hastings and bearing northwards in the direction of London. At the end of about ten miles, as you go along this ridge, it throws out a spur of high land towards the west, then goes on for about a mile, and then suddenly stops, and you descend into the valley; but as you do so, you see a pretty rising slope of ground opposite, along the crest of which there now runs a terrace-wall. That wall encloses the court of Battle Abbey. As I stood looking from that wall over the autumn landscape towards the sea, on the 14th of October last, I conceived the idea of the lecture I am now reading to you, as I called to mind Sir Edward Creasy's eloquent description of the great fight here fought, and reflected how the progress of the world has indeed been governed by battles. On the anniversary of that day, 800 years ago, was fought the battle of Hastings, and on that very spot stood King Harold, watching the army of Duke William, not yet 'the Conqueror,' as in three successive divisions it came in view over the spur of high ground I just spoke of, and descended into the valley below the spot where Harold's standard was pitched, and he stood with his two brothers, and his body-guard of Londoners around him. The exact spot is known, for on it was afterwards placed the altar of the Abbey, the beautiful ruins of which remain to this day. But who was Harold, and who was the Duke William? Harold was the son of the Saxon Earl Godwin, who, though not royal, was the nearest to the crown. Harold was the favourite of the people, and their electoral King, and was said to have been named by Edward the Confessor as his successor. William, the invader of England, was the Sovereign Duke of the Normans, or Northmen, who had fought their way downwards from Norway and Denmark into France, and wrested from its king the territory to which they gave the name of *Normandy,* which it has since retained. William also had a claim to the crown of England, and Harold had some years before, when on a visit at the Norman Court, been trapped into an acknowledgment of it more serious and solemn than he intended, by an artifice thoroughly characteristic of the time and the people. Swearing oaths which they never meant to keep was mere pastime; but if the table on which the swearer laid his hand happened to have a monkish relic concealed within, the whole complexion of the case was altered. And so it was with Harold; the impious absurdity of disclosing the pretended chemise of the Virgin Mary and some other 'relics' equally trustworthy, on the removal of the covering, was considered to give sanction to a reluctant oath exacted from a guest who had not the power to refuse. William turned this to the best account, and brought against Harold an excommunication from the Pope, which alarmed his brothers and friends very much; and they tried hard to induce him to give up the command and absent himself from this battle. But Harold's best title to the throne of England was the admirable skill and courage with which he had defended her coasts from the terrible Danes and Norsemen, whom he had only just defeated with tremendous slaughter at Stamford Bridge in Yorkshire. From thence he had flown to the coast of Sussex, to receive the new invader who had landed his whole army while Harold was 400 miles away thus engaged. Harold's friends advised him to stay in London till a new army should collect, and not risk a battle with his reduced and march-worn troops. Had he done so we should probably have never heard of 'William the Conqueror.' But this he would not listen to; he was flushed with victory, fresh from routing an army which had come in 500 ships, and had sent off in 15 what was left of a greater invading force than that he was to meet at Hastings. He was self-confident and eager, and *in four days* he accomplished the march to the Bay of Pevensey. Posting and entrenching his army with great skill along the crest of the hill, looking towards the sea, he resolved to await the onset of the Normans with the forces he had ready at hand.

If the Danish invasion of Yorkshire and the Norman descent upon the Sussex coast had been two parts of the same plan, they could hardly have been better timed to distract Harold's power, and take advantage of his fiery valour; but the Normans, although originally of the same blood as the recently defeated invaders of Yorkshire, had now, since their settlement in France, become polished and civilised, and the first people in Europe in all knightly accomplishments; and a happy thing it was eventually for England that the attack was successful which united with the blood of our Saxon forefathers, that high-mettled race—the bravest and best of all who had ever stepped on our shores.

The accounts given of the night before the battle exhibit the characteristics of the two races. The Saxons spent it in draining horns of ale, and shouting round their camp fires; the Normans in silently preparing their weapons and armour, listening to the exhortations of their leaders, and receiving, by a thousand at a time, religious sacraments from the priests who attended the army. Indeed, some spies Harold had contrived to send into the Norman camp brought back intelligence that the invaders were chiefly *priests*, mistaking for such all the Norman knights who, amongst other refinements, had adopted the practice of shaving their beard; a mistake analogous to that of the Russians, whose riflemen, in the first battles of the late Crimean war, committed terrible havoc amongst our army surgeons, supposing their flowing white plumes to be the distinguishing mark of general officers.

The battle of Hastings began at nine in the morning. The Normans came on in three divisions, attacking the English along the whole front of their line, which they had made impenetrable to cavalry, by a stockade of sharpened ash poles driven into the ground and wattled together. Three o'clock came and no impression was made. The stakes defied the cavalry, and the shields kept off the Norman arrows. The historians tell us that William then ordered his archers to elevate their bows, and send one flight of arrows in the air, so as to fall into the rear ranks of the Saxons, possibly with the object of occasioning some confusion in the rear, and causing a pressure that might break the front line from behind; for one can hardly imagine otherwise the utility of the order. The archers, however, so well obeyed it, that according to a recent historian the very air was darkened over the heads of the Saxons, causing them to gaze upwards. It was in this fatal shower that an arrow is said to have pierced Harold in the face, over the right eye. The wound, though not mortal, was the death-blow of that well-fought day to the Saxons. Suddenly blinded by the shaft, which he tore out from the flesh in his anguish, and crushed to pieces in his hand, and overcome by the torture of the wound, Harold 'bent forward over his shield,' unable any longer to direct the battle. The effect of his lost command was shortly manifest. Practising the very stratagem by which Harold himself but a week before had won the battle of Stamford Bridge, William, after a sudden dash of his cavalry against the stockade which had so long resisted them, ordered the Norman centre, which he commanded in person, to make a feigned retreat. The hot-blooded Saxons, no longer withheld by their brave and experienced commander, broke away from their line of defence, and rushed forward. In a moment all his wise precautions were lost. Pouring down the hill in disorderly pursuit the Saxons followed the wily Norman ranks into the valley. You may see from the courtyard of Battle Abbey the very spot where the steady ranks of the invaders faced round in compact and deadly array upon their tumultuous and shouting pursuers. You may see the grassy slope up which the cavalry dashed within the now undefended entrenchment, while the fierce hand-to-hand conflict was going on below, and cut off the retreat to their own lines of those who escaped from the carnage. On went the cavalry towards the body-guard of the men of London, who surrounded the royal standard. 'There Harold had remained defending himself to the utmost, but sorely wounded in his eye, and in grievous pain. One man in the throng' (I quote the words of an old chronicler) 'struck him on the ventaille of his helmet and felled him to the ground, and as he was recovering himself, another beat him down again, striking him on the thick of his thigh, and cutting down to the bone. But there was so much eagerness of so many around,' continues the writer, 'that I know not who it was that slew him. Whether he died of that blow I know not, but it was said he fell under it, and rose no more.'

Thus died the brave and noble Harold. But the battle was not over yet. The consummate skill with which he had posted his army was proved by the slaughter which it cost the Normans to defend themselves against the desperate rally which the Saxons again made to recover their position, and the obstinate conflict in the wood behind, when driven back from their ground on the brow of the hill, and after the fight had become hopeless.

> 'So well the bill-men plied the ghastly blow,
> Cutting through Norman helm and coat of mail,'

that out of an invading army of sixty thousand no less than fifteen thousand lay dead upon the field.

A touching tale is told of the search for Harold's body in the night, amidst the confused heaps of dead that lay around the royal standard. Long and vainly the monks of Waltham Abbey (which he had munificently founded) sought, with their lanterns, the lifeless body of their king. At length a female figure was descried through the darkness bending over one mutilated form, of majestic mien—for Harold was of noble stature. 'The eye of love proved keener than that of loyalty and gratitude, and Edith "the swan-necked," his beloved Edith was found weeping over the mangled remains of her newly-married lord and lover, in the midst of that field of carnage;' and the monks bore him away, and interred at Waltham Abbey the last and bravest of the Saxon kings of England.

And now I come to the last and the greatest of this string of battles; a battle fought within the memory perhaps of some who sit here to-night; the name of which remains amongst us as a household word. I have walked and ridden over the field on which it was fought, and I know almost every yard of the ground. Years ago, when at Oxford, I have had the privilege to grasp the hand of the hero who conquered in that field; and I have watched the solemn scene—which seems but yesterday—when the streets of London, from Apsley House to St. Paul's, stood clothed in solemn drapery of black, like one extended funeral chamber two miles in length, as his mortal remains were borne to their last resting-place. Need I say that I speak of Wellington, the conqueror at Waterloo?

You have heard, no doubt, that our Queen was some time ago invited by the Emperor Napoleon III. to a 'European Congress.' It is now nearly fifty years since there was such a congress. On the 11th of March, 1815, after three and twenty years of war, there sat a splendid conclave, comprising most of the crowned heads of Europe, in the royal palace at Vienna. Such a company had seldom in the history of the world been seen together before. Suddenly a booted and spurred officer, fresh from a long and rapid ride, was ushered in, and placed a letter in the hands of an old white-haired gentleman, covered with stars and orders, who sat amongst them. Slowly, and with great deliberation, he opened and read the letter handed to him. His countenance was one that never changed. He seldom spoke except 'to conceal his thoughts,' if we may trust his own aphorism. Yet those who knew his countenance, read something then upon those impassive features which struck a sudden silence into the august assembly. At length he rose quietly from his seat, and in a voice trembling with the effort of habitual suppression he slowly gave the substance of the letter to the assembled monarchs. The burthen of it was short. Sir Walter Scott has made it still shorter—'The devil has broken loose! Napoleon has escaped from Elba!'

If the first words had been literally true, the consternation upon those assembled faces could hardly have been greater. There was a moment of dead silence and blank astonishment. And then, what do you think they all did? Kings and ministers are but men of flesh and blood. We have it on the authority of that same white-haired old gentleman, Prince Talleyrand, that they all, without exception, *burst out laughing.* 'Double double toil and trouble!' all to be resumed again after three and twenty years of incessant warfare, in which most of the armies of Europe had been beaten, and most of the thrones shaken by Napoleon Buonaparte, the revolutionary potentate of France, and general enemy of Europe; and after he had with infinite trouble been at length caged like a rat in the little isle of Elba, and the kings and ministers had met as I have described, to re-arrange and restore what he had so long disordered, behold! their solemn sitting is broken up by the intelligence that the Emperor had escaped again, and was now on his way to Paris, at the head of the whole French army.

The Duke of Wellington was sitting at that congress, the representative of England. He alone on the broad fields of Castile had with a small British force boldly encountered a French army of twice its numbers, and sent it back in defeat. Next, at Salamanca, he had scattered an army of equal force with his own by an assault of a single hour.* And lastly, at Vittoria, had driven the entire French army like a flock of frightened sheep, over the Pyrenees. He had beaten all Napoleon's best generals, Junot, Victor, Massena, Ney, Marmont, Jourdan, and Soult; but he had never met Napoleon himself. Well might the assembled congress turn to him for advice in this new and final emergency. And not in vain: he at once agreed to proceed into Belgium (which lying on the frontier of France would be the first point of Napoleon's fresh attack upon Europe), and with such troops as could be despatched from England,† and such Belgian, Dutch, and Hanoverian troops as could be at once collected on the spot, to hold Napoleon in check, while the armies of Prussia, Austria, and Russia, lying further off, were being collected. The nearest of these to the probable scene of action was part of the Prussian army, under Marshal Prince Blucher, whose head-quarters were at Aix-la-Chapelle, a little south of Belgium, and who was soon ready to co-operate with the forces that were quickly despatched from England. But Napoleon was a rapid foe; and never was his genius in assembling and handling large masses of troops displayed with more promptitude and skill than in the rapidity with which he brought together the finest army he ever had of 150,000 splendid troops, mostly veterans, determined to crush the English and Prussian levies first, before the European powers had time to come up. By the end of May he had his whole army together, curtained behind the fortresses on the N.E. frontier of France, ready to burst forth at whatever point he might choose.

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* I think it was the French General Forey who said that in that battle Wellington had beaten 'forty thousand men in forty minutes.'

† Unfortunately the flower of the English army, including his old Peninsular veterans, were then in America, or on their voyage back.

As it was impossible to tell where that would be, the British and Prussian forces had to extend their line along the whole frontier for some hundred miles, yet in such manner as to close as speedily as possible at whatever point the French army might burst forth. No easy guard to keep, as Buonaparte's movements were concealed behind his fortresses, and his plan was to break out between the English and Prussians, and attack them separately, being far superior in numbers and artillery to either. And even if he could, without a battle, wedge himself between them, and by a rush could reach Brussels, the beautiful capital of Belgium, to which all the roads from the French frontier led direct, he well knew that the Belgians would declare in his favour, and their country be too hot for any army but his own.

He laid his plan well. He knew that Wellington had but a small number of English troops, not exceeding 24,000, and half of these fresh drafted from the militia, who had never seen a battle, with about 6,000 good German troops; the rest of his force being a mixed body of Hanoverians, Dutch, Belgians, and Brunswickers, of whom Buonaparte took little account.

But Wellington well knew the importance of Brussels, and there he had fixed his head-quarters; and the presence of so many troops had made the city very gay. The Duchess of Richmond had issued cards for a grand ball, on the 15th of June, to the officers of the allied army. The Duke of Wellington was an invited guest. About noon on that day, a slight sound of distant cannonade was heard in the direction of Charleroi; at three o'clock the Duke's private aide-de-camp brought him intelligence that the French army was in motion; before five o'clock every regiment had its orders from the Duke, and they began their march, that evening, to the front. If there was one acknowledged English quality more remarkable than another in Wellington it was his thorough coolness and self-possession, and dislike of excitement or display. It was most important that there should be no alarm amongst the population of Brussels, who were most of them Buonapartists at heart. The Duke himself remained in the town (whilst the troops were steadily marching out), enjoining the same caution upon his officers. Even the ball was not interrupted, and the officers who attended it, with the Duke himself, left the ball-room one by one, to avoid giving the least appearance of alarm, and galloped off through the short summer night, to their regiments already on the road to Quatre-Bras.

Buonaparte's first move was as successful as he could wish. He attacked the Prussians at Ligny the following day, the 16th, by themselves, and compelled them to retreat to Wavre. This obliged Wellington to fall back from his forward position at Quatre-Bras, in order to keep up his communication with Prince Blucher; and the point to which he fell back and made his stand was a spot of which his soldierly eye had before marked out every feature, as an admirable position for a battle. It was near a little village on the high road from Charleroi to Brussels, bearing the English sounding name of Waterloo.

It is a pretty ride of seven or eight miles from Brussels to Waterloo. The road is skirted on the left, for most of the way, by a thick beech wood called the Forest of Soignies. Six and twenty years have passed since I first rode along by that wood—not so many years, by four, after the battle had been fought. Leaving the wood, and passing through the village with its little old-fashioned church, the road rises gradually and comes out upon the crest of a long line of high ground, with a shallow valley before you, running to the right hand and the left, and from half a mile to a mile across: as you look over it, you see a similar range of rising ground opposite, rather higher than that you stand upon, and not quite so regular. A kind of seam or shallow trench runs along behind the crest of the latter ridge, in which a person lying or kneeling would scarcely be seen from the opposite one. The road you have travelled goes right across the valley, cutting several feet deep into both the hills. As you look along the valley to the right, you see at some distance the shattered remains of a snug little turreted house enclosed by a garden, orchard, and wood of ash and beech trees; and close beneath you, near the road, there is a farm-house of less pretension. And away to the left, as far as the eye can reach, you can distinguish the scattered line of a distant forest.

I have described the field of Waterloo, seen from the centre of the British position close to where the Duke stood, in the battle of the 18th of June, 1815. Stretching for a couple of miles along the ridge opposite, lay the French army. The snug little villa on the right is the château of Hougoumont; the farm-house just before you by the road is La Haye Sainte; the scattered forest (of Planchnois) far away on the left is that to which the Duke's field-glass was often turned during the battle, expecting the brave Prince Blucher, who, in spite of his beating on the 16th, and his own wound, had promised to bring a division of 25,000 of the Prussian army from Wavre, dragging his artillery through twelve miles of bad road, ankle deep in mud, after a deluging night of rain.

Through that deluging night the British army had to bivouac as best they could upon the wet field, waiting for the morning and the battle. Meantime Buonaparte had sent off 30,000 men under his general, Grouchy, to engage the beaten Prussians, and prevent their coming up again to join the British army; a force quite inadequate for the purpose. But Blucher improved upon the example, by detaching exactly half that number from *his* army (which, since the battle of the 16th, had been reinforced by fresh troops under General Bulow) so that he might still keep his appointment with Wellington for two o'clock on the 18th.

At length that eventful morning broke, still raining heavily, and as it dawned it displayed to the English army (most of them fresh to the sight of war and about to enter their first battle), the French army occupying the whole of the opposite ridge, over an extent of upwards of two miles in length—one army of veterans, perfect in all its appointments—upwards of 80,000 in number, with an artillery of

246 guns. Of the British army itself, 24,000 only were English, 6,000 of the old German Legion, and these, with Hanoverian, Dutch, Belgian, and Nassau troops in British pay, made up a motley force of about 67,000; but with an artillery weaker by nearly 100 guns than that of Napoleon. This inferiority in artillery was a serious disadvantage, and would have been more serious but for the talent and perseverance of Sir Augustus Fraser, who, in spite of the most vexatious opposition, had succeeded in substituting 9-pounders and a few 12-pounders for the old-fashioned 6-pounder field guns, to which our War-office adhered with the usual official pertinacity, and which would have been powerless against the heavy artillery of the French.

The sun rose, and gradually the rain slackened; and then the two armies saw each other clearly, and the narrow space of waving corn (for it was near the Belgian harvest time) clothing and concealing the field upon which the fate of Europe was to be that day decided. 'When daylight discovered to Napoleon that the English army was still in position' (writes General Fleury) he returned to his head-quarters full of satisfaction, exclaiming, 'I have them, then, at last—these English!' It must be remembered that Buonaparte himself had never met the English before, and he had some difficulty in reconnoitering the English line, and noticed this to General Forey, one of his aides-de-camp, who had seen a good deal of Wellington's way of handling troops in the Peninsula; General Forey answered, 'Wellington never shows his troops till they are wanted; but *if they are there*, I warn your Majesty *que l'infanterie Anglaise en duelle est le diable.*' Napoleon then rode along the line of his magnificent army—the finest he had ever brought together—and received their enthusiastic cheers as the earnest of a victory on which he most fully calculated.

But the ground was like a morass, from the heavy night's rain, and he delayed his attack till a few hours of dry weather on this *midsummer Sunday morning* should make it practicable for his cavalry and guns. Eight o'clock came, and nine o'clock, and ten o'clock; half-past ten! The church bells in England and Scotland had begun their service-peal. Many a heart in the British ranks may have thought of that. And little thought Napoleon Buonaparte that while he was *waiting*, Blucher and the Prussians were *marching*.

At length, as the clock in the little old-fashioned church at Waterloo struck eleven, a gun on the left centre of the French army opened fire, and immediately a dark column of 18,000 infantry, led on by Prince Jerome Buonaparte, was seen moving rapidly down towards the little chateau of Hougoumont. It was as Wellington had expected. That place was the very key of the British position; and quickly the practised eye of Napoleon saw it, and tried to seize it; but he had a soldier to deal with that day whose eye for a battle field was seldom at fault. There Wellington had ridden down that morning before dawn, to arrange for its unfailing defence; and in the chateau and the orchard around it he had massed a whole brigade of British Guards. Down came the French troops, column after column, with fiery valour upon that little wooded spot, and backwards they fell, rank by rank, under the determined fire of the Guards. Finding the post so obstinately contested, the French mortars opened upon it over the heads of their own attacking columns, and while the fiery shower was poured into it overhead, fresh columns were again and again launched against its resolute defenders. Amid shot and shell, and the blazing fragments of the timbers of the chateau, which was soon on fire, bravely the Guards stood their ground. More than once the French had gained the copse and the orchard, and penetrated to the wall of the enclosure. As they reached it, up rose the Guards from behind, and a sudden deadly volley, over and through the loop-holed wall, rolled them back again. But it was now so surrounded by heavy masses of troops from the French left wing, that they were able to mask it by their own troops, and penetrate beyond, up to the English right wing, leaving the English Guards shut up in it like a blazing furnace. The cannonade had long ago extended along the whole line of battle; but never throughout the whole day was this contest at Hougoumont suspended; no less than 8,000 French troops were sacrificed in the attempt upon it, without success, to the last.

Waterloo has been said to be a 'battle in five acts;' this persevering attack upon Hougoumont was the first.

About one o'clock the second act began, by Napoleon directing a grand attack of nearly 30,000 French infantry against the centre and left of the English army. They came on in four massive columns, led by General Ney, 'the bravest of the brave,' in the hope of cutting the English army in two, and separating

Wellington from his auxiliary troops, who were chiefly upon his left wing, and from any Prussians who might be able to come up. As the attacking columns marched across the valley, a battery of seventy-four guns was pushed forward behind them, and poured a tremendous fire over their heads into the British ranks waiting to receive them.

One column bore to the right against our left centre, where the Dutch Belgian brigades were stationed, who no sooner saw the skirmishers open fire as the column came up the slope, than the whole brigade turned and fled to the rear, amidst the groans and jeers of the British troops behind them, and never stopped, it is said, till they got to Brussels, where they spread the report that Wellington's army was beaten and in full retreat.

On came the French column, delighted with the easy rout before their eyes; but as the flying Belgians disappeared, another front, of different material, appeared behind them, for there stood General Picton, with his 'fighting brigade' of 3,000 British, ready to receive them. The French column halted to deploy into line, and as they did so, Picton seized the critical moment; a close and deadly volley was poured in upon them, and then, with a fierce hurrah, the brigade rushed forward with the bayonet. The French reeled back, and as they staggered in confusion down the slope, Ponsonby's brigade of horse dashed in among them, cutting them down by whole battalions, and taking 2,000 prisoners. On went the cavalry towards the seventy-four advanced guns, sabreing the gunners; and then cutting the traces of the horses, rendered those guns useless to Napoleon for the remainder of the day. In this splendid charge the brave Picton fell, shot through the brain, but not till he had completely beaten off the attack. After silencing the battery, Ponsonby's cavalry galloped too far, and met with a body of Cuirassiers, who threw them into serious confusion, but were in turn fiercely attacked in a hand-to-hand cavalry fight by the heavy cavalry of the English household troops and Scots Greys led by Lord Uxbridge.

It was now past three o'clock. The grand infantry attack upon the British centre, the second act of the great drama of Waterloo, had totally failed. The allied army had suffered terribly from the unremitting cannonade which had continued for nearly four hours: but no part of the British line had been forced.

Napoleon now determined on a desperate attack with the whole body of his splendid cavalry of reserve upon the weakened centre of the British line, against which he launched 12,000 cavalry, half of them cuirassiers, heavy-armed, in forty squadrons. How this tremendous attack failed it is difficult to conceive. But the Duke, prepared for every emergency, massed his infantry into squares to receive them, pouring a crushing fire of grapeshot on the advancing squadrons. On they came with dauntless courage, driving our artillery men from their guns, who retired into the squares, having, by the Duke's orders, first taken off a wheel from every gun, to prevent their being carried off; and as the cavalry fell back to re-form, the gunners left the squares to ply their guns upon the retiring squadrons. There probably never was such a trial of 'pluck' as this part of the battle presented, lasting upwards of two hours. Not a single square was penetrated, and the utter failure of this attack is best described in Napoleon's own words, 'Ney behaved like a madman; he got my splendid cavalry *massacred* for me!' And this failure was his ruin. He risked all upon this cavalry attack, and lost it; and so completely was this fine body of horsemen destroyed, that at the close of the day, when the British swept over the field, he had not a single regiment of cavalry to oppose to them, to cover his retreat. Thus failed the third act of the battle.

It was now about half-past four o'clock, when the Duke, who had long in vain pointed his field-glass towards the woods of Frischmont, far away on the left, at last saw the rising smoke of the Prussian guns opening upon the flank of the French army. Napoleon assured his men that it was only Grouchy coming back to their aid, after defeating the Prussians at Wavre. But he knew well what the signal meant, and was now obliged to detach a portion of his army to hold the Prussians in check, while he made his last and final attack, in desperate determination to break the British line before the Prussians could unite with it. He had now no longer the advantage in numbers; but his 'Old Guard,' the veterans who had won for him many a battle, and formed his 'reserve,' had as yet taken no part in this; and with these unconquered troops he determined to make a last bold stroke for victory. Marshal Ney was placed at their head, and Napoleon himself rode forward, and as they passed him in their advance, pointed with his sword towards Brussels, where, indeed, it is said, he had *ordered his supper.*

Such was the tremendous cannonade which preceded this attack of the Imperial Guard, kept up over their heads as they moved majestically up the slope, that the English brigades were ordered to lie down, and when the French came up they saw nothing before them but a small knot of mounted English officers. The French columns were within fifty yards, when a voice from that group of officers shouted out 'Up, Guards, and at them.' Up they rose to their feet in perfect order, and poured in a volley with such precision that it sent down three hundred of the leading column of veterans before they had time to deploy. The column made a noble effort to open into wider formation, to face the steady English line, but the crushing volleys pouring in as they tried to form, disordered them irreparably. The right word was given at the right moment for the bayonet charge, and the English brigade sprang forward with a loud cheer against their dismayed antagonists, and the late compact column became a rout.

But the English Guards dared not pursue, as the second column was advancing, somewhat aslant, from the direction of Hougoumont, to meet which the English had to recover their rank formation. This second column however, by exposing its flank to

General Adams's brigade as it came on, fared worse than the first. This was the *fourth act*. It was now seven o'clock.

But Napoleon was not yet vanquished. He was just rallying the Old Guard after its repulse, and collecting the broken remains of his cavalry for a final attack, when the Duke of Wellington, having received intelligence from Blucher himself that he was actually engaged with the French right wing, felt that the moment was come when duty no longer compelled him to remain on the defensive. The decision and boldness with which he seized the opportunity, are among the finest traits in the history of military deeds. He had been attentively watching the field with his telescope for some minutes when he was seen suddenly to shut it up, and he cried out, 'Now every man must advance!' Long had this order been eagerly expected. It flew like lightning right and left, and was received along the line with shouts of joy. It was nearly eight o'clock, but at that moment the setting sun, which had been obscured all day, broke out and glittered upon the bayonets of the allied army as it burst forward with one long cheer upon the whole French host, thrown into confusion and dismay, and pressed upon by the British and Prussian forces, which joining upon the field, overwhelmed every attempt at formation, and the rout became a headlong flight. Wellington himself rode like lightning to the rear, to bring up the light cavalry there stationed, cheering them on, with his hat off, and receiving their hearty shouts of congratulation. As he galloped forward at their head an officer ventured to warn him that they had got within the enemy's lines, and his life was in danger. 'Never mind!' was his answer, '*the battle's won*, my life does not matter now!' Shortly afterwards he and Blucher met, and Wellington willingly resigned to him the task of further pursuit. The British, exhausted from their long day's work, remained upon the field, but the Prussians drove the wretched fugitives before them throughout the night, and of the magnificent host of that morning, few ever assembled in arms again.

The French loss could never be accurately known; of Wellington's army 15,000 fell; and the Prussians, during the few hours they were engaged, lost nearly half that number, upwards of 7,000. Such was the price at which the deliverance of Europe was purchased.

It was a favourite remark with the French and even some English critics, that but for the Prussians the Duke would have been overwhelmed. No one who understands the campaign or the battle would be guilty of so foolish a detraction. What the Duke of Wellington undertook to do was to withstand the French army with his own very inferior force, provided Blucher, whom he trusted as a brother, could join him at two o'clock from Wavre with 25,000 of his army. What he did was far more than he had undertaken, for he held the ground six hours longer, and, notwithstanding Blucher's unavoidable delay, the British line was never forced at a single point nor lost a yard of ground. He won the battle, in fact, by the very means with which he undertook to win it, and without which it would never have been fought.

It has been truly said that 'war is of all calamities the greatest.' The Duke of Wellington himself declared—and who could speak from more successful experience?—that the worst thing next to a defeat was a victory. But if war is the greatest of calamities, it is also the theatre of great talents and great virtues. The qualities of mind which it developes afford lessons which few things can better display, and which nothing can efface. A better illustration of this could hardly be given than in the sequel to the battle of Waterloo, presented in the two following letters from the Duchess of Wellington, extracted from the recently published 'Seaforth Papers.' The first is dated Monday, June 26, 1815, and is as follows: —

'The intelligence of the last two days, or rather of yesterday morning and evening, is of the most interesting and wonderful nature, and at the same time the most probable result from the late events at Waterloo. It is not yet official, but it is credited. Buonaparte, after the battle of the 18th, made an effort to collect his troops and rally them. Finding it impossible, he has turned with all speed to Paris, and reached it on Tuesday night. He immediately assembled the Corps Législatif, stated with more truth than he had ever told before, although with much lying, that the French arms *had been completely successful till four o'clock* on the 18th; that at that time unfortunately the *New Guard* made a charge to which they were unequal, that they were unexpectedly repulsed by a body of British cavalry, and not being accustomed to fighting had given way and fled, drawing with them in their flight the Old Guard;

that some ill-intentioned person gave the word, *Sauve qui peut*, on which the flight became general, and that half his army had disappeared, and his artillery *en totalité.* He concludes: "Thus terminated this day, so glorious for the French arms, yet so fatal!" He desires them to take the measures necessary for the glory of France without delay. Such were the accounts received yesterday morning. Last night arrived the continuation, that in pursuance of the directions received from Buonaparte, the legislative body proceeded to deliberate, and in a few hours came to the determination of informing Buonaparte that having lost a fine army in a few days, he no longer possessed the confidence of the people, and that he must make up his mind to abdicate; that he accordingly abdicated a second time, and it is imagined, but not asserted, that he is under arrest.

'Did I not tell you the spurious would vanish before the true hero? What is he now, if these accounts are confirmed? To those who have lost their friends, this result, which secures or rather promises future peace, will be the best consolation which heaven in this world could bestow.'

The second letter is dated

'Apsley House, February 19, 1818.

'You will have heard of the horrible attempt to assassinate my husband, the Preserver of Europe, the first, the greatest of men. But the same Hand that has ever protected him in the day of battle protected him now—the same Eye watched over him, and ever will, I am sure. . . . No discovery is yet made of the assassin. I never trembled for the Duke in battle, but now I have not a quiet moment. It is not true that he ran after the assassin; he did not even know that he had been shot at, if he had, the man would surely have been taken. He thought the report was from a musket of one of the sentries, which he supposed had gone off accidentally.'

'For this attempted assassination,' adds the editor of the collection of letters from which the above are extracted, 'it will be recollected that two men were tried (Cautillon and Marinot), but they were acquitted as the *corpus delicti* had not been established. No trace of the ball shot at the Duke could be discovered.'

The fact of Napoleon leaving Cautillon a legacy of ten thousand francs is, perhaps, the most despicable of all his petty crimes. 'Cautillon,' he said, 'had as much right to assassinate that oligarchist, as the latter had to send me to perish on the rock of St. Helena'—a statement, as Scott has remarked, striking not merely for its atrocity, but for the inaccuracy of the moral reasoning which it exhibits. 'Napoleon has drawn a parallel betwixt two cases, which must be therefore both right or both wrong. If both were wrong, why reward the ruffian with a legacy? If both were right, why complain of the British Government for detaining him at St. Helena?' The inconsistency is palpable, but Napoleon did not reason on the matter. He had been baffled, defeated, and overthrown, and all ideas of truth or justice were lost in his rage and egotism.

Look, now, upon this picture, and on this:

An officer of artillery came to the Duke during the battle to tell him that he had a clear view of Napoleon, and had several guns ready pointed: but the Duke exclaimed, 'No, I'll not allow it. It is not *the business* of commanders to be firing upon one another.' Again, after the Capitulation of Paris, with the same noble feeling which had forbidden his officer to fire upon Napoleon during the action, he firmly resisted Blucher's desires for his execution. General Müffling tells us that the Duke said to him, 'I wish my friend and colleague to see this matter in the light I do; such an act would give our names to history stained with a crime. Posterity would say of us, "They were not worthy to be his conquerors;" the more so as such a deed would *be useless*, and can have *no object.*'

Such was the gentle spirit, the accurate and far-seeing philosophy, which guided the mind of 'the victor of a hundred fights;' and such are the greatness and the littleness, such the contrasts of character, which the events of war bring out into relief. The theatre of action it affords, the momentum with which its impressions strike the mind, give to its lessons a prominence and a force which in the earlier periods of history could with difficulty be derived from any less incisive teaching. But while we admit this, let us endeavour to feel that we are speaking as of the Past, as of an exceptional not a normal condition. War has had its uses, even its necessity, in the development of our race; but War is not a necessity. It is the sacred privilege of Christian civilisation to show that Peace has its no less glorious struggles, its victories, and its Heroes.

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